

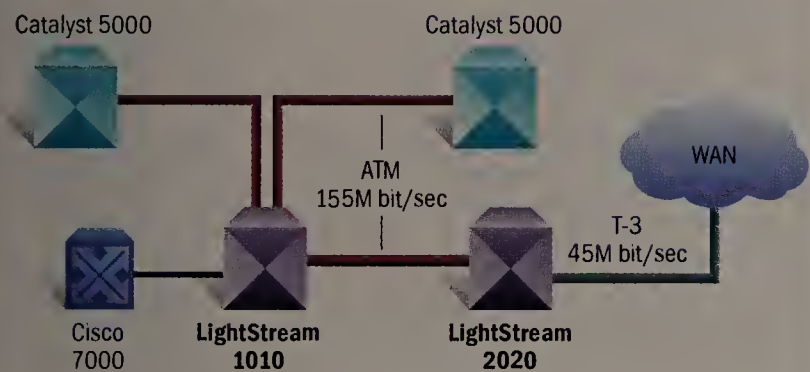
NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Beware the
**FAX
BEAST**

Tips for helping your keep
fax costs in check. Page 51

LIGHTSTREAM ATM NETWORKS



Cisco's LightStream 1010 will replace the LightStream 100 — manufactured by NEC — as a workgroup/backbone switch. In a CiscoFusion environment, the 1010 will concentrate links from Catalyst 5000 switches and access routing information from Cisco 7000 routers.

GRAPHIC BY SUSAN PULASKI

Cisco's fresh ATM start

Homegrown LightStream 1010 first in new product family.

By Jim Duffy
San Jose, Calif.

unveil the first of what is expected to be a family of workgroup and backbone ATM switches that feature a field upgradable hardware module for adding

class-of-service functions. The homegrown LightStream 1010 is a 5G bit/sec modular Asynchronous Transfer Mode switch that can support as many as 32 155M bit/sec ports or 16 45M bit/sec DS3 links.

Newbridge offering moves token-ring traffic over ATM. See page 6.

See Cisco, page 73

EDI heavies push data over the 'Net

By Ellen Messmer

Use of the wild and woolly Internet to transmit critical electronic data interchange messages has been considered heresy by the civilized EDI world. EDI purchase orders and shipping forms are simply too important to entrust to the Internet, a lair for cybercrooks.



Harbinger's Tycho Howle says the move to EDI over the Internet is inevitable.

But this week, EDI vendors Sterling Software, Inc. and Harbinger Corp. will break with the past when they unveil plans to adapt their respective Unix and PC-based EDI products for use over

See EDI, page 8

Microsoft: Net OLE on the way

New 79-page spec is detailed enough to let IS groups get crackin' on development.

By John Cox
Redmond, Wash.

Microsoft Corp. has quietly released the first details of how it will distribute OLE objects across networks.

The company has hosted a document on its FTP server about the Component Object Model (COM) that includes a specification for Network OLE. Although the spec is missing some essential elements, it will give MIS staffs enough direction to begin marrying OLE desktops with host-based applications, even before Microsoft releases part of Network OLE sometime next year.

Today, OLE lets users inte-

Read the specs yourself and grab a Cushing Group white paper on the networking abilities of today's OLE. Link to <http://www.nwfusion.com>. Select News+ then Front Page.

NetworkWorld Fusion

grate applications and components on a single computer running a Microsoft operating system. Network OLE is essential for linking OLE-compliant applications on Windows and other platforms over a network. It can also tie OLE to applications based on the Object Management Group's Common Object Request Broker Architecture.

The new specification adds considerable meat in vital areas such as object security, Microsoft's network protocol, connectible objects and object events, and the Interface Definition Language.

Security details are a key part of the updated spec. "They talk about security, and you can see what the API will be like," said Don Box, principal scientist at Developentor, a Los Angeles company that specializes in object technology training and consulting. "Before, it was simply not addressed."

See OLE, page 73



STEVE BURNS

QA Want to know where AT&T is really going? The carrier's top strategist, Richard Bodman, speaks out. Page 10.

Net management

Vendors take blame for stalled standards efforts

By Charles Bruno

You might say it was a case of the pot calling the kettle black. At a Network World-sponsored roundtable discussion on systems and network management issues, a Microsoft Corp. executive labeled as divisive an IBM plan to marry the Desktop Management Interface (DMI) to the popular SNMP management protocol.

"There are some real problems with the direction that IBM has set out," says Keith Hamilton, a program manager for Microsoft's Business Systems Division. "It is limit-



Top execs debate the future of DMI and other systems management issues.

ing the capability of what DMI can truly provide. You are limiting the capability of what DMI can truly provide. You are limiting the capability of what DMI can truly provide.

See Net mgmt., page 71

In-Site Insurer writes NDS policy

By Kevin Fogarty
Simsbury, Conn.

It was a licensing issue, not a technology one, that persuaded network architect Art Mafale to adopt NetWare 4.1 for his segment of ITT-Hartford Insurance Companies' network.

But it was the benefits of the Novell, Inc. NetWare Directory Services (NDS) system Mafale built that swayed the rest of the company to follow suit.

See ITT, page 72



Art Mafale won over upper management with the promise of more consistent security.

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This Week



News+

The Front Page:

- Learn the ins and outs of doing EDI over the Internet.
- P-NNI is a key protocol for Cisco's new ATM switches. Download our primer to find out why.
- Third-party vendors are rolling out a raft of management tools for Novell's NetWare Directory Services. See what's new.

The Technical Sections:

- Find out what makes Cabletron's Spectrum platform tick, in WANs & Internetworking.
- See the security systems Sony and Visa plan to use on their new mega-Web site, in Electronic Commerce.



NetRef

Technology Resources: We've pulled together a series of resources on E-mail management, in E-mail.

Other areas

- **Professional Development:** New seminars.
- **DirectConnect:** Download demo software.
- **Network World Central:** Get in touch with us.

this week's pick

Want to see who's really making money off the Internet craze? Check out the Internet Millionaires page, <http://www.pulver.com/million>, which lists companies and individuals that, at least on paper, are now worth at least \$1 million because of their investments in Internet start-ups.

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NetworkWorld's Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.

News briefs, November 27, 1995

NetWare to go public

■ AT&T and Novell, Inc. this week plan to announce the commercial availability of AT&T NetWare Connect Services (ANCS), a public NetWare network built and maintained by AT&T. ANCS is the first in a series of public nets being developed by Novell and its carrier partners. The networks will provide services designed to give customers plug-in access to WAN and LAN resources.

Getting in sync

■ Hitachi Computer Products (America), Inc. this week will introduce SyncWare 2.0, a new version of its electronic mail directory synchronization software, as well as an agent for synchronizing Microsoft Corp. Exchange directories with those from other messaging systems. The new edition of SyncWare, being shown at the EMail World and Internet Exposition in Boston, includes an improved user interface and network testing features, among other things. The new Agent@Exchange will support links between Microsoft Exchange directories and those for cc:Mail and other systems. SyncWare agent pricing starts at \$1,995, and server pricing starts at \$4,995.

On a buyout binge

■ Platinum Technology, Inc. in Oakbrook Terrace, Ill., continued its buying spree last week, snapping up two application development tool companies. Platinum bought Santa Barbara, Calif.-based Softool Corp., which makes change and configuration management tools, for about \$25 million. The company also added ProtoSoft, Inc. in Houston to its stable. ProtoSoft, which cost Platinum about \$40 million, makes application design and analysis tools. The acquisitions will round out Platinum's existing tool offerings, which include the AionDS and ObjectPro development tools, and Final Exam testing tools.

Turmoil at Cable & Wireless

■ Cable & Wireless plc last week ousted its two top executives following disputes about the direction of the company, while U.S. wireless pioneer Craig McCaw denied a London newspaper report that he would make a bid for the company. Out are Cable & Wireless Chairman Lord Young and Chief Executive Officer James Ross; a spokeswoman confirmed that there are no executive changes in the U.S. subsidiary Cable & Wireless, Inc. The parent company has been criticized for a muddled global network development strategy, despite long-standing full or partial holdings in many foreign carriers.

Still in charge at the AT&T spin-off

■ Patricia Russo will continue as president of AT&T's Global Business Communications Systems (GBCS) unit when GBCS is spun off next year as part of the new AT&T communications equipment company, AT&T announced last week. The new firm, which also includes the Network Systems unit that sells gear to telephone companies, will be based at the current Bell Laboratories headquarters in Murray Hill, N.J.

America Online takes Europe on-line

■ Deutsche Telekom and two German publishing companies last week said they would join with America Online, Inc. to offer a European-wide on-line network. The service is expected to start in Germany by the end of the year and in the U.K. and France early next year. DT also said it will buy a 5% stake in America Online, matching the holding of Bertelsmann A.G., one of the German publishing partners.

Adding Win95 to its mix

■ Gradient Technologies, Inc. has introduced a 32-bit version of its Distributed Computing Environment (DCE) software for Windows 95. The previous 32-bit release was for Windows NT. PC-DCE/32 for Windows 95 has the complete set of DCE core services, such as remote procedure calls, security, timing and naming or directory. These services will let Windows 95 desktops be integrated with enterprise-scale distributed DCE applications. The software is available now. The developers' kit costs \$695; run-time licenses are priced at \$110 per PC.

IBI extends middleware reach to the enterprise

By Barb Cole

New York

Information Builders, Inc. (IBI) next month will announce several partnerships and products designed to transform its flagship middleware offering into a system for dynamically linking heterogeneous enterprise applications.

The company will strike deals with software makers to embed messaging and Open Database Connectivity (ODBC) capabilities in its Enterprise Data Access (EDA)/SQL middleware. IBI also plans to license technology to enhance EDA/SQL's management capabilities, said sources familiar with the plan.

EDA/SQL is SQL-based middleware for connecting front-end applications to dozens of data sources.

The company declined to comment on the announcements, which sources said will be

made at the DB/EXPO '95 trade show here on Dec. 5.

Sources said IBI will license technology from Momentum Software, Inc. that will be the basis for a line of EDA/SQL message-oriented middleware products to be announced during the first quarter of 1996.

The software will enable users to layer messaging atop existing

applications and databases, including those based on ODBC. Today, message-based middleware often involves writing custom front-end applications that can take advantage of messaging capabilities.

In addition, IBI plans to license an ODBC Driver Manager from Visigenic Software, Inc., sources said. That technology will be the core of an EDA/SQL offering, expected in the second quarter of 1996, that lets users access data sources via ODBC. As a result, users will be able to choose between

See Middleware, page 72

IBI's partner party

Partner	Product plans	Availability
Momentum	Will work with IBI, which will deliver a line of middleware based on Momentum's messaging and queuing technology.	Unannounced
Visigenic	EDA ODBC gateway for Unix that is based on Visigenic's Driver Manager.	Q2 1996
Software One	EDA/Exchange product for moving metadata between different repositories.	Q2 1996
Tivoli	An interface for managing EDA/SQL servers from the Tivoli Management Environment.	Q2 1996

Token ring over ATM

Newbridge turns Blue with new edge device

By Tim Greene

Herndon, Va.

Newbridge Networks, Inc. will fill out its ATM LAN offerings this week with the announcement of an edge device that can transmit token-ring traffic across an ATM fabric.

Complementing a Newbridge Ethernet switch that shipped earlier this year, the VIVID Blue Ridge device will offer token-ring users desktop speeds across campus links.

At the same time, it allows users on the Asynchronous Transfer Mode migration path to phase in the cell-based technology gradually.

Users can leave their token-ring LANs in place but still improve performance between

LAN segments, Newbridge officials claimed.

To the user, latency in the ATM switched token-ring network is much lower than the alternative of linking token-ring segments over shared FDDI. "It looks like a single hop to the person at the desktop," said Peter Rauch, assistant vice president of marketing for the Newbridge VIVID unit.

For large enterprises that include both Ethernet and token-ring LANs, the Blue Ridge token-ring and Yellow Ridge Ethernet devices can team up to ship both types of traffic across the same ATM backbone simultaneously.

Blue Ridge and Yellow Ridge, however, do not allow communication between Ethernet and token-ring segments, but that capability is planned within the next couple of years, according to Rauch.

Blue Ridge features 10 token-ring ports that can handle speeds of either 4M or 16M bit/sec. It comes with one OC-3 (155M bit/sec) port on the ATM side

but can be configured with two to provide redundancy.

The device offers token-ring emulation through its support of source route bridging, which is compliant with the ATM Forum's LAN Emulation standard.

Blue Ridge, like other VIVID products, is designed for private networks in a campus environment, not for WANs over public networks.

The VIVID line of ATM LAN products, which includes network interface cards, offers route servers and the Yellow Ridge Ethernet switch.

Unlike Yellow Ridge, Blue Ridge cannot act as a local switch; it provides straight frame forwarding to ATM. However, if users demand it, Newbridge might develop such a local switch, Rauch said.

Blue Ridge fits into the VIVID edge-to-edge ATM architecture, which is managed by VIVID System Manager separately from the individual network LAN segments.

Deployment will start next month, with expanded distribution coming in the first quarter of next year.

The list price for Blue Ridge is \$18,000, which includes LAN-emulation software. Depending on the quantity ordered and other factors, users could see significant discounts, according to Rauch.

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BUSINESS ON THE 'NET

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Solutions for a small planet™

UB to extend VLANs across bridged and routed nets

By Jodi Cohen and Jim Duffy
Santa Clara, Calif.

UB Networks, Inc. this week will unveil software for its switching hubs that will let users extend virtual LANs across bridged and routed networks.

The company's Virtual Networking Architecture (VNA) II implementation — the second part of a three-phase VLAN strategy — will let companies group ports among multiple UB switching hubs into VLANs. The software supports UB's DragonSwitch, ASM5361 FDDI Multiprotocol Bridge/Router and GeoLAN/500 switches.

VNA I software, which is used by about half of all UB switch customers, works only across a single hub.

VNA II will be on display here at the VLANs: Virtual LANs and Switching conference this week.

VLANs are logical groupings of devices that can be physically located anywhere on the net. Analysts said VNA II is a much more functional and scalable implementation than VNA I.

"They went back to the development board and tried to come

up with something that was a little bit more practical and useful," said Skip MacAskill, a senior research analyst at Gartner Group, Inc.

Other observers noted that VNA II is similar to other vendors' plans to give users the option to establish VLANs by

grouping together ports on separate devices.



UB's Pike

But only a few vendors, such as Cisco Systems, Inc., have publicly endorsed the VLAN frame tagging scheme employed in VNA II.

The software release will support 65,000 separate VLANs and 32 workgroups within a VLAN, said Tyrone Pike, senior vice president and chief technical officer at UB.

UB's Virtual Networking Architecture rollout

- ▶ VLAN I: Allows port-level VLANs to be created within a hub chassis. Shipping since the second half of 1993.
- ▶ VLAN II: Extends port-level VLANs across multiple hubs in a bridged or routed environment using frame tag identifiers. Will ship in the first quarter of 1996.
- ▶ VLAN III: Adds ability to define VLANs according to media access control addresses. Will ship in the second half of 1996.

A workgroup is a subset of nodes in a virtual net, according to UB. This lets different switching hubs participate in the same VLAN and allows workgroups to share a group of resources, such as a mail or Notes server.

The UB approach relies on the IEEE 802.10 frame tagging

scheme, a security standard that has been adopted for use with VLANs. By tagging frames, network devices can recognize whether a frame is part of a given VLAN.

The standard calls for encrypting ordinary Ethernet packets and then attaching a header to them, providing the VLAN information. When a

packet reaches its destination, the receiving device strips off the header and turns the packet back into a regular Ethernet frame.

But creating these oversize packets can increase latency, said Mary Petrosky, an analyst at The Burton Group in Salt Lake City. "One problem with 802.10 is that by changing the packet size, switches will have to do fragmentation and defragmentation. There's a lot of processing overhead in that," she said.

Nonetheless, Pike said 802.10 still is better than a proprietary VLAN implementation.

"The 802.10 standard as a method of interplaying between different vendors' virtual LAN solutions is going to be an important common denominator," he said. "Although 802.10 may not be the total solution for all deployments, it is definitely a place where people can agree upon a method of passing virtual

LAN information."

In addition to the software upgrade, users will need to purchase UB's Virtual Network Visualizer (VNV) management application.

VNV — which works in conjunction with UB's Empower net management platform — is a graphical user interface-based tool that allows net managers to drag and drop users into their functional groups, such as the marketing or human resources VLANs. The application runs Windows NT and Windows 95 consoles.

Pricing for the VLAN software upgrade and management application has not been set, although analysts expect the package to cost considerably less than other vendors' products. Both will ship in the first quarter of 1996.

©UB: (408) 496-0111.

BeyondMail to hit the Internet

By Kevin Fogarty
Westborough, Mass.

Banyan Systems, Inc. this week will announce this week at EMail World an Internet version of its BeyondMail electronic messaging product.

The new version, due to ship by year-end, includes links to the World-Wide Web and native support for a variety of Internet messaging technologies.

BeyondMail's rules-scripting language will gain hooks to HTML, letting net administrators link BeyondMail's forms-

See BeyondMail, page 72

EDI

Continued from page 1

the Internet.

The vendors said EDI over the Internet will appeal primarily to small and midsize companies that have shied away from EDI due to the metered rates of value-added network (VAN) carriers.

But there already is evidence that big companies, too, are willing to use the Internet for EDI.

Among the early adopters of the first Internet EDI product called Templar, released earlier this year by Premenos Corp., are the not-so-tiny National Semiconductor Corp. and Sun Microsystems, Inc.

The Internet, by nature, is less reliable than a closely controlled VAN service. But the VANs charge by the byte for each EDI message, which can make the 'Net less expensive, particularly if EDI managers can push the EDI traffic through the T-1 Internet access point shared by the rest of the corporation.

"It's probably a 75% difference, especially if you have a flat-rate Internet connection at your company," said Mike Gordon, manager of the electronic commerce group at Avex Electronics, Inc., which has been sharing EDI messages over the Internet using Templar.

Harbinger, whose EDI customers include Mobil Oil Corp., Amoco Corp. and Baxter Healthcare Corp., said the move to EDI over the Internet is inevitable.

"BellSouth invested \$3 mil-

lion and we invested \$9 million to deliver these products," said Tycho Howle, Harbinger's chief executive officer. "We want to have companies trading electronically over the Internet."

Howle said the Internet may not be appropriate for certain types of EDI traffic, such as electronic payments, but is acceptable for CAD/CAM files or product schedules.

Sterling, which offers a VAN service and a wide range of EDI products, will announce it is adapting its Gentran and Forms product line for TCP/IP, and is offering an Internet service for EDI messages, sources said.

Both Harbinger and Sterling are expected to detail encryption features to safeguard EDI traffic over the Internet. However, security could shape up as a stumbling block since vendor messaging security systems are not interoperable.

The Premenos Templar EDI product, for example, uses public-key technology for digital signatures and encryption, but it requires all trading partners to use Templar security servers for checking signatures and decryption.

Premenos is developing a version of Templar based on the Secure Multi-purpose Internet Mail Extensions standard, raising the prospect that vendors may build interoperable Internet EDI products in the future.

In what it calls its WebEDI concept, Premenos this week will detail how small companies with

Web browsers can do EDI directly at Web sites by entering data into a posted EDI form. The form can then be sent to the receiving EDI trading partner.

Barbara Reilly, research director at Gartner Group, Inc.'s electronic commerce division, said it was unlikely the Internet would diminish the role of VANs.

"With the VANs, people are buying message management, mailboxes, message conversion and trading partner support," said Reilly. "They're still going to need this."

Some lawyers advise, however, that companies need to craft new trading partner agreements for exchanging EDI traffic over the Internet. Firms use these agreements today to detail procedures and liabilities companies will accept when things go wrong when using one or two VANs.

"The Internet is fundamentally different," said Charles Merrill, a partner at the Newark, N.J., law firm McCarter & English. "There's a lot of security risk moving from a closed environment to a more open one."

Trading partner agreements for the Internet should address issues such as liabilities for using digital signatures.

Merrill said the American Bar Association has spent considerable time pondering this subject, and suggestions for how companies might proceed are contained in the ABA's Digital Signature Guidelines document posted at <http://www.intermarket.com/eci>. ■

Netscape serves up E-mail server

By Ellen Messmer
Mountain View, Calif.

This week, Netscape Communications Corp. will unveil an SMTP/MIME mail server that will exchange electronic mail between internal networks and the Internet.

The Netscape Mail Server is based on technology licensed by Santa Barbara, Calif.-based Software.com.

The \$495 Netscape Mail Server is administered via a standard HTML browser and will ship early next year.

Netscape declined to discuss how the mail server technology plays into its acquisition of Collabra Software, Inc.'s groupware product. But analyst Gary Rowe, principal with Rapport Communication, pointed out that the

server will lay the foundation for transforming Collabra groupware into Internet groupware.

©Netscape: (415) 254-1900.

CORRECTIONS

A photo of Centillion's Bobby Johnson was mistakenly run in place of a photo of IBM's William "B.J." Johnson (Nov. 20, page 6).

Information in the diagram that appeared with a story on FDDI (Nov. 20, page 41) was incorrect. The ports for the primary and alternate paths were mislabeled. The primary path always uses the B ports.

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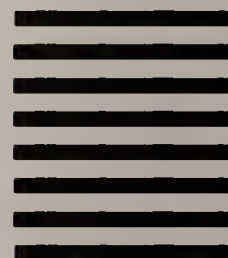
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Frank talk from top AT&T strategist

Richard Bodman discusses the corporate breakup, new services and multimedia plans.



Big companies are supposed to be conservative, predictable, even boring. But AT&T turned the business world on its ear earlier this year when it announced its second divestiture: a plan to break up into three companies, only one of which — the network services unit — will retain the AT&T corporate identity built over decades. AT&T also has launched an aggressive attack on the local services market and is making a big push in Internet and multimedia services.

As senior vice president for corporate strategy and development, and a member of AT&T's Management Executive Committee, Richard Bodman reports to CEO Robert Allen and is part of the brain trust shaping AT&T: The Next Generation.

In an interview with *Network World* Editor in Chief John Gallant and Senior Editor Joanie Wexler, Bodman discussed AT&T's local-loop war plan, how the Internet fits into the carrier's service mix and what you can expect from the new AT&T.

What are the key challenges AT&T faces?

Up until now, AT&T has been participating in four segments of information technology: computing, premises equipment, network systems and communications services.

We felt for a long time that it was worth it to keep that up until we could see some clear patterns of the future. But we've decided the cost of managing across — in terms of decision making, speed and focus — was greater than the benefit we'd get in that new environment, particularly with the advent of heavy competition between RBOCs and AT&T.

This split-up liberates the [businesses], forces them to focus on their areas and not think about the rest of the company. Each of the groups is now encouraged to make partnerships and go forward.

The timing of the breakup is

interesting because in other segments of the industry, say network equipment, we're seeing consolidation. The theme is always one-stop shopping, customers wanting to minimize the number of suppliers.

That clearly is happening out there. In fact, you can find any trend and a significant number of transactions to support it.



"This split-up liberates the [businesses], forces them to focus on their areas and not think about the rest of the company."

You're going to find continued fractionalization, where small companies come up with critical skills for specific solutions. They're going to have a valuable position in this new world because those solutions often can be more cost-effective.

At the same time, we're moving toward branded names. Big companies will be the branded names, and those companies will be depended upon for solving big problems. You need a partner who can afford to stay with you over a long period.

You talked about some of the potential benefits of the breakup. What are the dangers?

The risk is losing focus on your customers. We have a lot of people around here saying,

'What is my next assignment going to be? How do I fit in this new game?' That's a diversion. Our job is to quickly resolve those issues and get it done.

What should your customers expect?

Customers should expect the same quality and delivery they're getting from AT&T. Any customers with contracts that involve more than one of the companies can count on the fact that we will work together to make sure we deliver as specified under the contract.

Can you clarify AT&T's local-loop strategy? It seems to involve the possibility of building, buying and working with competitors.

You said it all. It's a fact that we have local monopolies, and the barriers a powerful monopoly has cannot be overestimated. Somebody getting into that market has to use a combination of strategies to spend as little capital to create as much leverage as possible in doing business with local carriers.

New players have some advantages. One is technology. Wireless offers us opportunities to put up nets quickly that can reach customers willing to pay for access. If we demonstrate that costs are reasonable and that prices will come down, that's going to have a big affect — not only on the prices charged by the RBOC in that community, [but] on RBOCs in other communities.

What's the key to winning that local business? Is it price? The way you bundle services? Multimedia services?

At this stage, all anybody has is research. We don't know. But price and quality for basic service are going to continue to be very important things. Being the company with a large national brand, it's pretty clear we're interested in building packages of service capabilities. There are certain advantages to bundling. But even where bundling is very powerful, a super-efficient competitor that comes into one segment at an attractive price is going to make a good living.

In terms of pricing, you're always behind the eight ball

because you're either reselling, you have to build facilities or pay the price of an acquisition.

The price that people set isn't really based on cost. It's based on market conditions. We — and our competitors — are reconfiguring our companies to get our costs aligned to what we believe the price structures are going to be. In the long run, efficiency is what this game is all about. Everything we're doing is to get us very lean and very mean.

What's required to change this situation in the local loop? What direction would you like to see telecom reform take?

You need some serious supervision so monopolies can't — either on purpose or by mistake — make it difficult for another entrant to come into the business.

Today, we order up a line from a local phone company, and if somebody gets sick for a week or something goes wrong, we take it in the teeth. We're asking that there be redress if mistakes like that are made, and that the local phone companies can't come into long distance until we've got that covered.

The other issue is price. You can lease our circuits on a discount-for-volume basis. In the local markets, we're finding nothing, no discounts. We want this legislation to provide cost-based availability of their nets.

Would an acquisition or merger with a big local player such as GTE Corp. — which has been rumored — be an option for AT&T?

Let me answer that this way. If we could suddenly flip to a new world, say five years from now, there would be some number of what I'll call end-to-end players in the U.S. It's logical that there will be some consolidations of that type. But we don't comment on anything we're thinking about, and there is no legal basis for us to be thinking about it or discussing it today.

One would assume an acquisition would be low on the scale because it would cost more.

Yeah. What you're seeing today is many companies doing transactions to gain some advantage. They're trying to get some content to manage or some vertical integration to manage. They're paying very, very healthy retail prices to get that done. Then they have to turn around

and recondition their networks, reposition those companies and spend more money to get them ready to compete in the future.

AT&T has had to do some of that, too. That's what we did when we acquired McCaw. We either had to get into the game then or forever be a small player. But many of us would be wiser to keep our powder dry, build on what we know and let some of these transactions settle down.

What role will you play in helping get wireless data going?

Wireless communications is going to be bigger than the pundits say. I can't tell you what price it's going to be at. But if we flip over to five or six years from now, wireless will be a fundamental part of almost everybody's life.

Today, [wireless is] a game of reach. A wireless franchise gets, say, another \$10 million [in investment] and the owner of that franchise says, 'I can add 50% to the territory I cover, or I can fix up the holes in my system.' It looks as though they're all saying, 'I need the 50% in territory. I'll get value out of that and fix up the holes afterwards.' As soon as it's a game of quality and reach, then you're going to have a real surge in the number of wireless users.

Many of the opportunities MCI Communications Corp. and Sprint Corp. are pursuing are the same as those AT&T is pursuing. How would you differentiate AT&T's strategy?

AT&T is fundamentally in the hosting business. We're offering

our customers platforms on the network [over which] they can converse or run their whole business. Those platforms are multimedia platforms, as well as specific data and voice platforms.

Our task is to put enough software capabilities on them and to get out enough tools to customers and developers that they develop [applications] to work on top of the network.

Others have said, 'We think our advantage comes from signing up a few [partners] and having exclusive relationships.'

Do you see the Internet as a competitor?

No. I see the Internet as an enabler and an opportunity creator. The second part of hosting See AT&T, page 73



STEVE BURNS

LOOK INSIDE THE MIND OF AT&T

There's lots more about AT&T's

strategy, its Internet plans and what

the future holds for AT&T customers in the full transcript of this Q&A,

which is available on Network World Fusion (www.nwfusion.com).


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Ascend extends remote access

By Jim Duffy
Alameda, Calif.

Ascend Communications, Inc. next week will unveil a remote access device for corporate and branch office sites that provides dial-up network access via ISDN and frame relay.

Ascend's MAX 1800



- ▶ Supports eight ISDN BRI's
- ▶ Features two expansion slots for modem cards
- ▶ Supports one Ethernet AUI or 10Base-T attachment
- ▶ Routes IP and IPX traffic over ISDN and frame relay links
- ▶ Costs \$6,400 to \$7,200
- ▶ Is available in December

The company also will announce desktop software that allows remote users to access data and applications on distant computing resources.

The remote access device, called MAX 1800, supports eight ISDN Basic Rate Interfaces for WAN access and two expansion

slots for modem and terminal server cards. The modem cards provide dial-up access where ISDN service is unavailable, and the terminal server function provides telnet access to TCP/IP host computers.

MAX 1800 connects to a LAN via AUI or 10Base-T Ethernet attachments. It also has a synchronous V.35 port that lets an 1800 at a regional site connect to a corporate net via a frame relay switch or data service unit/channel service units (DSU/CSU) at up to 8M bit/sec. Other protocols supported include PPP, V.120, SLIP, IPX and Apple Remote Access.

Rather than filling a niche left open by competitors Shiva Corp. and Xylogics, Inc., the 1800 fills a gap in Ascend's MAX product line, analysts said.

It fits in between MAX, which sports two T-1 and ISDN Primary Rate Interfaces as well as six expansion slots, and MAX 200, which has no WAN interfaces but supports eight PC card slots for modems, ISDN terminal adapters and DSU/CSUs.

"[MAX 1800 has] the traditional number of connections and the range of connections that have been supported by 3Com, Shiva and Xylogics," said Rolf McClellan, senior consultant at Strategic Networks Consulting, Inc. in Rockland, Mass. "So this is a move [by Ascend] into

that area."

The MAX 1800 is priced from \$6,400 to \$7,200 and will be available in December.

The new remote node software, meanwhile, is called MAXLink. It enables a remote PC using standard phone lines to connect to any Ascend remote access server that supports PPP. Once that connection is made, MAXLink allows remote users to work with any application that

resides on a PC or server at a corporate office site.

MAXLink is similar to packages offered by Network TeleSystems, Inc. of Sunnyvale, Calif., and Stampede Technologies, Inc. of Dayton, Ohio, that are resold by Cisco Systems, Inc.

MAXLink comes bundled with all Ascend MAX products.

©Ascend: (510) 769-6001.

AT&T lights fire under disaster recovery services

By Joanie Wexler

Basking Ridge, N.J.

More than a year and a half after announcing disaster recovery options for its InterSpan frame relay network, AT&T last week finally gave its customers the go-ahead to use them.

While users waited for services to get out of controlled use and into general availability, AT&T restructured its pricing. The new pricing should make the services palatable to customers worried about failures but squeamish about footing the bill to duplicate their networks.

To soothe those users, AT&T has now added three InterSpan options priced so customers pay big bucks only when a disaster happens, not every month.

The fees to turn on the recovery services in the rare instance they are needed run \$2,500 or \$5,000, depending on which plan the user selects. The options in which AT&T reroutes traffic to a secondary site also carry a nominal monthly fee for each permanent virtual circuit (PVC).

AT&T will now help users reconfigure their PVCs — the paths traffic takes within the frame relay network — during an outage. Previously, AT&T took no active role in rerouting traffic in its net based on user-specified priorities. To ensure protection, users had to buy duplicate PVCs.

This has been particularly expensive with AT&T services because, unlike rival LDDS WorldCom, AT&T does not drop its per-PVC price with each additional one a user buys. And LDDS WorldCom in February chopped in half the price of PVCs being used for backup in half.

"There is no reason a user should have to pay full price for backup PVCs," said Tim Burke, a data communications analyst at The Yankee Group, a consulting firm in Boston.

AT&T's main competitor, MCI Communications Corp., offers no formal frame relay disaster recovery service with specialized pricing. MCI customers build disaster recovery into their nets when they negotiate their contract, and pricing is determined on a custom basis.

With its new Access Protection Option (APO), AT&T will now transfer all the PVCs connected to a given access link to another port if there is failure on that link or the equipment attached to it. The backup port must be geographically collocated with the primary port.

This service can save companies thousands of dollars per year compared with the duplicate-PVC scenario (see graphic).

These savings are not astronomical for a big company concerned about backup, but they "beat a stick in the eye," said Terry Korus, operations manager at InterSpan shop Bemis Company, Inc., a packaging firm based in Minneapolis.

APO, though, will likely not be appropriate for Bemis because many of its 50 sites are in remote locations where "it would be difficult and expensive to get a second line," Korus said.

Net insurance just got cheaper

Sample AT&T disaster recovery cost

Recovery method	Annual cost
Buying duplicate PVCs	\$69,084*
Access Protection Option (APO)	\$62,712** or \$65,212 with one \$2,500 activation in a year

Users can save \$6,372 per year using the APO if they do not activate the backup procedure.

* For Method 1, costs are from AT&T's frame relay price list for a sample configuration with two 386K bit/sec ports at the primary site, 56K bit/sec ports at nine remote sites and 18 32K bit/sec PVCs (nine are active and nine are used only in a disaster).

** For Method 2, the configuration is the same, except users buy only nine 32K bit/sec PVCs, which AT&T will flop over to another port in a disaster.

Bemis might, however, use AT&T's new Growable PVCs option in the double-meshed PVC configuration he is building so every site has two paths attached to it, Korus said.

Growable PVCs allow users who already have connectivity to a secondary site to increase the speed of that PVC to handle traffic overflow during a disaster. Users pay the AT&T list price for that PVC plus a \$15 premium each month for the ability to grow it up to 1.024M bit/sec.

And with the Backup PVCs option, AT&T will transfer all PVCs from one site to a secondary user's or service provider's backup site that is geographically remote. The user pays a flat \$15 per month fee for the backup PVC, regardless of its speed.

AT&T and LDDS WorldCom both require the customer to call them to activate backup procedures. AT&T said it guarantees net reconfiguration within 3 minutes of that call. ■

COMMENTS?

See "How to reach us" on page 5.

Good luck finding the chapter on UNIX connectivity.

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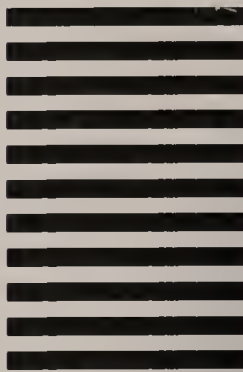
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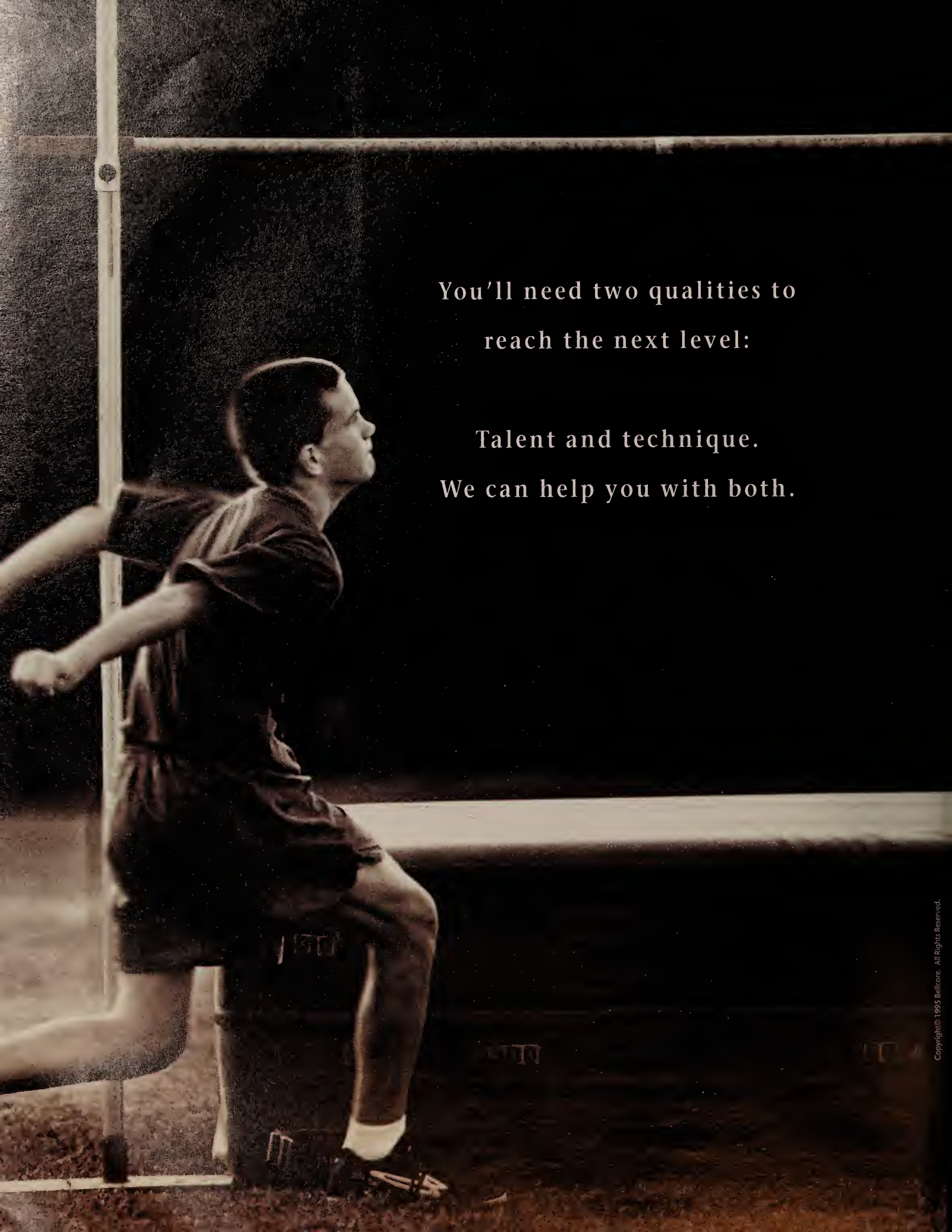


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WANs & Internetworking

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Briefs

■ Multi-Tech Systems, Inc.

last week unveiled two versions of its new mux that integrates ISDN interoperability and routing. MultiMux comes as a rack-mountable card or a stand-alone. Both handle voice, fax and data.

They are available with a Basic Rate Interface ISDN port that can bond both BR1 64K bit/sec B channels to make a single 128K bit/sec line. The products start shipping in the first quarter of 1996 and are priced starting at \$1,199 for the rack-mountable card and \$1,299 for the stand-alone.

Multi-Tech: (800)328-9717.

■ Last week, Cisco Systems, Inc. renamed its Combinet, Inc. remote access line the Cisco 750 series and unveiled enhancements to its routing software.

The Cisco 750 series is comprised of three ISDN routers enhanced to interoperate with Cisco's higher end devices. They are priced from \$999 to \$1,799. The line also includes Connect-Pro, Windows-based software for managing the 750 series.

The enhancements to Cisco's Internetwork Operating System software are designed for use with ISDN lines. They include RFC 1717-compliant PPP Multilink and RFC 1570-compliant PPP Callback support, and IP Address Negotiation. The enhancements are intended to maximize bandwidth and improve security.

Cisco: (408) 526-4000.

■ SA Corp. announced the availability of a high-end system management tool for enterprise-wide job scheduling and application workload management. Version 4.1 of SQL Operator features a new Master/Agent architecture that enables systems administrators to manage application processing across multiple heterogeneous servers in a distributed client/server environment.

SQL Operator 4.1 is available now starting at \$16,000.

ISA: (206) 644-2121.

Cabletron Test Drive wins over converts

By Jim Duffy
Rochester, N.H.

Cabletron Systems, Inc. says its Spectrum management software has won over some users of Digital Equipment Corp., Hewlett-Packard Co. and SunSoft, Inc. products.

The company is wrapping up its Spectrum Test Drive program, a sales incentive designed to

uproot rival platforms from customer accounts. Under Test Drive, users had until Sept. 30 to sign up for a free Spectrum 3.1 license with which they could replace a single license of Digital's Polycenter Manager on NetView — based on IBM's NetView for AIX — HP's OpenView or SunSoft's SunNet Manager.

Without providing exact figures, Cabletron said "hundreds" of companies have signed up for Test Drive, and some are now Spectrum converts. Those that have converted include the University of Southern California (USC) in Los Angeles, AlliedSignal, Inc. Ocean Systems in Sylmar, Calif., Holstein Association in Brattleboro, Vt., and a large semiconductor manufacturer that requested anonymity.

See what's
in store for
Spectrum 4.0 through exclusive
Network World reports. Link to
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IXCs stretch frame relay reach

Carriers tie in more users with PPP, ISDN, wireless and other options to keep up with users' changing work habits.

By Joanie Wexler

The reach of AT&T and MCI Communications Corp. frame relay networks is quickly fanning out.

This is partly because of the two carriers' relationships with international X.25 partners. These partners have begun helping the U.S. carriers extend their networks with frame relay-to-X.25 protocol translation services in parts of the world where there are no frame relay services available.

MCI's partner is British Telecommunications plc; AT&T has teamed with Infonet Services Corp.

In addition, AT&T and MCI have launched or are developing alternative access methods such as ISDN, PPP-based services and wireless options to accommodate the changing work habits of the corporate user.

Different types of access to frame relay networks are important as the fast-packet nets continue to soar in popularity. Corporate computing environ-

ments keep getting more distributed, so it is no longer only large sites with dedicated T-1 links that are climbing on these nets. Satellite offices, telecommuters and mobile workers are now trying to link in, too.

To satisfy those users, AT&T is working to allow by the end of this year small sites and telecommuters to tap corporate LANs across their frame relay nets using ISDN, according to Mike Robinson, product manager for AT&T's InterSpan frame relay service.

MCI will be close on its rival's heels. It plans to launch ISDN access during the first half of next year, said John Dex, product marketing manager of access services at MCI.

ISDN's dial-up nature often makes access affordable for offices that would go broke paying for dedicated links. But this is not always the case, depending on where in the world the user is.

AT&T InterSpan frame relay customer Ikos Systems, Inc., a

See Frame relay, page 20

SPECTRUM TEST DRIVE A HIT?

Companies that have converted to Cabletron Spectrum via the Test Drive program

Company	Converted from
AlliedSignal Ocean Systems	SunNet Manager
Holstein Association	HP OpenView
University of Southern California	SunNet Manager
A large semiconductor manufacturer	HP OpenView, Digital Polycenter NetView

USC is replacing one SunNet Manager license with Spectrum, said James Weidel, director of networking for the university. One reason: SunNet Manager lacks the scalability to cost-effectively manage USC's growing network, he said. "To get SunNet Manager to manage all of our hubs, we would've had to have spent a large fortune plus a lot of time," he said, adding that many of USC's hubs are supplied by Cabletron.

Weidel also expressed doubt that SunSoft will continue to enhance SunNet Manager now that Solstice Enterprise Manager (EM) is on the horizon.

"It's a dead product," he said of SunNet Manager. "It will die in two years, more or less. Nobody wants to support two net management products."

SunSoft officials did not respond to inquiries by press time last week. They have said in the past, however, that they will continue to develop, enhance and sell SunNet Manager for smaller networks. Solstice EM is designed for networks of 10,000 or more nodes.

Nonetheless, USC chose Spectrum over Solstice EM due to its artificial intelligence capabilities, the heterogeneity of the USC environment and the stability of Spectrum's code. USC also liked its ability to segregate views of the network yet synchronize those views when changes occur.

AlliedSignal is also replacing a SunNet Manager license, handling 480 nodes, with Spectrum due to SunNet Manager's inflexibility, said Mike Kemp, senior net

See Cabletron, page 18

Hypercom execs see 1996 as hot for the SNA market

When it comes to the competitive SNA internetworking market, few have been as agile as Hypercom, Inc. The firm has grown from \$104 million to \$206 million in about two years, and it has established itself as one of the leaders in the SNA space, elbowing its way alongside such heavyweights as Cisco Systems, Inc., Bay Networks, Inc. and 3Com Corp.

Company Chairman George Wallner and Executive Vice President Paul Wallner recently had a quick-hitting discussion with *Network World* Senior Editor Michael Cooney concerning some of the company's future plans and competitive strategies for 1996.

What do you see as the biggest driving technology in the SNA market in the coming year?



Hypercom's George (l.) and Paul Wallner

G. Wallner: There is a huge revolution going on right now in the conversion of dedicated lines to packetized transmissions, or frame relay. The SNA world hasn't seen changes like this since its inception. All of the users who felt they couldn't afford to get rid of those dedicated lines are now seeing prices from the telcos come down enough that they can finally do it. This year has seen a mass con-

See Hypercom, page 22

Cabletron

Continued from page 17

engineer for the firm. But he noted his network is heavily Cabletron-supplied.

"[Spectrum] just gave me a lot more flexibility to do net analysis and traffic analysis," Kemp said. "I could also set up the [Cisco switches] to be managed under Spectrum easier than I could under SunNet Manager."

The Austin, Texas, semiconductor manufacturer is replacing Polycenter NetView and OpenView with Spectrum so it can have a single consistent management environment for its net and systems, said Gautam Roy, net and systems manager for the firm. OpenView manages about 150 nodes in the company's net, while Polycenter NetView handles Digital Giga Switches.

"It was a nightmare going to different machines with different software and bringing the icons up and everything," Roy said. "It was just a headache."

Other features of Spectrum — such as MaestroVision for systems management, Remote Monitoring support for LAN analysis, and SpectroPhone for dial-up alert notification and response — plus scores of Cabletron hubs installed at the company iced the deal, Roy said.

Holstein Association did not return phone calls by press time. ■

COMMENTS?

See "How to reach us" on page 5.

Business Briefs

Bay Networks, Inc. will comarket the ADC Kentrox AAC-3 Asynchronous Transfer Mode access concentrator, which aggregates voice, video and LAN data traffic for transport over ATM wide-area links from 56K to 155M bit/sec. The alliance complements Bay's ATM LAN product line by giving it a device to interface with the WAN.

Unisys Corp. will market FastComm Communications Corp. devices, focusing on its frame relay access products. Unisys will get preferential pricing, delivery and technical support from FastComm.

Intellicom Solutions, Inc. will resell remote access gear from Gandalf Technologies, Inc. to integrators nationwide, the companies announced.

ISDN MOVES AHEAD

ISDN and ProShare zap X-ray images to doctors

By David Rohde
Norfolk, Va.

A new WAN that zips high-resolution X-ray images among hospitals and doctors' homes shows that a complete ISDN solution can still cost a fair bit of change, despite some recent moves to lower prices.

But for a high-priority application, the cost of ISDN can be far less than other transport options offered by the telephone companies.

The teleradiology network is partially up and running among an anticipated seven hospitals and 35 homes of doctors associated with Medical Center Radiologists, Inc. (MCR). Each site utilizes an ISDN Basic Rate Interface supplied by Bell Atlantic Corp. to connect with MCR's high-resolution central reading station here.

When a hospital obtains an X-ray of a patient but does not

to the NT-1 network termination device required for ISDN lines. One port allows the radiological images to enter an Intel ProShare terminal. The other port is linked to a Gandalf Technologies, Inc. 5242 bridge, which provides connectivity to the teleradiology network and image compression.

At each of the seven hospitals, the configuration is similar, except that a Gandalf 5240 bridge is used because it can accommodate more traffic than what is usually conveyed by individual doctors through the 5242.

The file server for the teleradiology network is located at the central reading station. One full ISDN BRI utilizing the 128K bit/sec capacity of two bearer channels is used for network connectivity, while the other is used for transmission of medical images. Gandalf Express Stack — a bridge that can handle eight ISDN lines at once — relays traffic to the file server.

To run the application, each doctor's home must be outfitted with a Pentium-class PC. The addition of the Gandalf and Intel ProShare hardware and software bring each remote site's cost to \$4,000 to \$5,000, not counting ISDN usage costs to be assessed by Bell Atlantic (see graphic).

However, other teleradiology systems on the market involve proprietary terminals on each site that are unable to run off-the-shelf software and are more expensive.

An additional benefit of the new teleradiology network is that the medical images are stored on disks or CD-ROM instead of film, and doctors can retrieve images in a store-and-forward procedure.

Archiving digital X-ray images on CD-ROM can cost 30% less than conventional storage of X-ray film, Bell Atlantic officials claimed. And at the choice of individual doctors, specific images can be stored on any Windows-based PC. ■

At what price remote diagnostics?

A new ISDN teleradiology network in Norfolk, Va., linking seven hospitals and 35 doctors' homes with a central site may be pricey, but its cost is actually much lower than a comparable private-line network.

Equipment at each remote site:

- ▶ Pentium-based PC
- ▶ ProShare video hardware and software
- ▶ ISDN termination equipment
- ▶ Gandalf remote access bridges

Equipment cost:

- ▶ \$4,000 to \$5,000 per site

Expected annual ISDN usage costs:

- ▶ \$45,000

By contrast, a T-1 network would cost an estimated \$400,000 to \$500,000 per year.

have a radiologist on-site for a diagnosis, the image is shipped to MCR over ISDN.

Then the image is shipped out to the selected doctor — at the doctor's home or at a remote hospital — in a point-to-point configuration.

The application was written by Radiology Telenetwork International, Inc. It acts as an overlay on Intel Corp.'s ProShare conferencing system and was built with the ProShare developers' kit. Bell Atlantic adopted the application in its All@once Solutions program.

At each of the 35 doctors' homes, two ports are connected

WHERE IN THE WORLD IS GLOBAL '95?

For the first time, North American sites will be included in Global '95, an international distributed trade show highlighting ISDN, which is being held this week.

Larkspur, Calif. — Demonstration by AVM of America. (415) 464-4700.

Montreal, Ottawa and Toronto — Seminars, tutorials and discussions, as well as vendor demonstrations. (514) 870-8706.

Huntsville, Ala. — ISDN application demonstrations by the U.S. Army. (205) 977-5689.

San Francisco — Seminar program. (415) 542-5155.

San Antonio, Texas — Trade show with 40 vendors. (314) 331-2862.

MCI sites — The carrier will host 15 sites with demos including videoconferencing, LAN/WAN interconnection and telemedicine. (703) 903-1033.

Sprint sites — The carrier's demonstrations will be held in 17 cities. (913) 624-4210.

Company opens up the gates for more ISDN connectivity options

By Tim Greene

Network Express, Inc. recently announced a new architecture that makes it easier to manage its ISDN access and routing devices by putting them on a single operating system.

The company also announced a new product, Fusion, that allows remote ISDN links to Novell, Inc. NetWare servers.

Universal Access Architecture gives Network Express products — ISDN InterHub, ISDN Router and Link remote access devices — a single operating system. It also boasts modularized add-ons, so users can customize the features they get.

Those modules include bandwidth management, net management, user authentication for security, PPP, Multilink Protocol, standard compression, transparent bridging and IP routing.

Also, Network Express' new Fusion product incorporates an ISDN coprocessor board and a Novell NetWare Loadable Module. Installed in a NetWare server, it can integrate with NetWare Connect 2 or NetWare MultiProtocol Router 3.0.

Available by year-end for \$3,000, it features four Basic Rate Interface ports.

Also available by the end of the year are add-on software modules that allow X.25 traffic over ISDN B channels as well as frame relay over BRI lines. Each module costs \$1,000.

The company is developing an ISDN Primary Rate Interface processor for release during the first quarter of next year.

Also due in the first quarter

are modules that support routing and spoofing of IPX, AppleTalk and X.25 traffic over the ISDN signaling channel. Each will cost \$1,000.

©Network Express: (313) 761-5005.

Timeplex adds to ISDN allure

Ascom Timeplex, Inc. last week announced a software upgrade that gives users a variety of options for using ISDN to link sites on their nets.

Ascom Timeplex's Synchrony Release 5.1 software runs on four of its products: ST-1000 Integrated Transport Node, Enterprise Router, Access Router and Integrated Access Node.

The software can establish ISDN links based on the time of day to support peak traffic and can be used to establish backups to other links.

Synchrony 5.1 enables Access Router and Integrated Access Node to automatically establish ISDN overflow connections when peak network traffic exceeds the capacity of leased lines.

It also supports IP multicast traffic to minimize the amount of broadcast data on the network.

The upgrade is free.

Ascom Timeplex: (201) 391-1111.

By Tim Greene



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Enterprise-ing NYNEX to export private-line service

By David Rohde

New York

NYNEX Corp. has started to work with telephone companies in world financial capitals to replicate, through licensing, the features of its Enterprise family of private-line services.

The move is being made principally on behalf of users in the investment banking business. It began with the three-year renewal last June of a contract between NYNEX and the Securities Industry Association (SIA) to enable SIA members in New York to upgrade the current NYNEX services they receive to Enterprise.

NYNEX'S HOLD ON WALL STREET

Key facts about NYNEX's Enterprise family of bandwidth management offerings and its recently renewed contract with the Securities Industry Association (SIA):

Range of transport services:

T-1, fractional T-1, T-3, frame relay and extended FDDI

Range of bandwidth speeds:

2.4K to 100M bit/sec

Customer nodes linked to Enterprise hubs:

800

Lines committed under SIA contract:

43,000

Period of renewed SIA contract:

1995-1998

SOURCES: NYNEX AND SECURITIES INDUSTRY ASSOCIATION, NEW YORK

At the recent Communications Managers Association meeting here, NYNEX President Ivan Seidenberg said the regional Bell operating company has a goal to be a presence in 10 to 15 key global financial markets.

The Enterprise service allows users to change their bandwidth requirements on the fly while still maintaining the reliability of dedicated private lines. The Enterprise Network Control Center here provisions multipoint bridging, scheduled reconfiguration, on-demand reconfiguration, emergency planning and other services.

The NYNEX strategy has already started to unfold. In October, the RBOC signed a memo of understanding with Bell Atlantic Corp. for joint development of managed private-line services similar to Enterprise, said Bob Myers, director of product and business development for NYNEX's Business Network Solutions unit.

In addition, NYNEX is having similar discussions with 20 overseas carriers and has "secured agreements with a handful of providers," Myers said.

He would not identify the overseas carriers but said joint trials with them will start early next year.

"If there is a common platform for controlling the elements in the two footprints, it will be very simple for the two carriers to operate as if they were on one network," he said.

This, however, would require a dedicated line between the two carriers' local network control centers to share provisioning information, he added.

According to NYNEX, the provisioning allows it to change its focus away from a point-to-point "pipe" environment. Instead, it can move to an approach where application and bandwidth requirements for many customer locations are evalu-

ated and used to develop an enterprise network solution.

Enterprise service is primarily available in New York, especially in Manhattan. There are approximately 800 intelligent Enterprise customer nodes deployed at specific customer buildings. All of these are linked by fiber facilities to the Enterprise hubs located in NYNEX central offices. ■

Frame relay

Continued from page 17

multinational company, examined ISDN for its Tokyo site. "But we found that the ISDN prices were not that much different," said Ramon Nunez, president of the company, which performs high-speed simulations of integrated circuits. "So we went with the dedicated option."

ISDN can be attractive — particularly in the U.S., where monthly fees often rival those for regular telephone service — because it offers the highest dial-up throughput potential available, Dex said.

Users dialing in to a corporate LAN over one 64K bit/sec Basic Rate Interface ISDN channel should see improved response times compared with 14.4K or 28.8K bit/sec asynchronous dial-up lines. The bottleneck imposed by the comparatively low bandwidth of WAN links is a key inhibitor for remote users who want their systems to behave just like any other local node on a multimegabit-speed LAN.

Both carriers have services aimed at tempering discrimination against remote users needing LAN functionality. MCI launched a PPP-based service called Remote LAN Dial (RLD) last month. A flat fee allows registered IP users to dial up an Ethernet LAN on the MCI network at 28.8K bit/sec using an 800 number.

From there, amid a slew of security schemes, users' traffic is forwarded over a permanent virtual circuit (PVC) in MCI's HyperStream frame relay network to the customer's server.

The frame relay ports and PVC are included in the monthly RLD price.

In the second quarter of next year, the RLD offering also will support unregistered IP, an in-house IP addressing scheme in which IP addresses are not necessarily exclusive of those in other organizations. In the same time frame, RLD will support Novell, Inc. IPX and SNA, as well, Dex said.

Support of the higher layer protocols adds routing and addressing abilities. These allow remote users to see beyond just one LAN server across an entire internetwork, said Steve Sazegari, managing director at Tele-Mac, a consulting firm in Foster City, Calif.

AT&T, meanwhile, has offered its Information Access Service (IAS) dial-up frame relay access offering nationwide for about two years. Users dial directly into an

AT&T frame relay switch asynchronously or using SLIP at speeds up to 14.4K bit/sec over AT&T's X.25 network. This is done using a 950 local dial service. For one corporate price, AT&T 950 services allow all users to place local calls at no additional charge from anywhere in the country to access the net.

PPP support in the IAS service is expected by the end of the year. PPP manages higher layer protocols, such as IP, IPX and SNA. AT&T was not specific about which higher layer protocols it will initially support, however.

Both IAS and RLD accommodate mobile users because of their toll-free nature. AT&T said even though a given IAS user always is mapped to the same AT&T frame relay switch where his fixed corporate site's traffic originates, there is no charge for backhauling him to that switch when he is traveling.

In addition, MCI plans to open up analog cellular access to its HyperStream net in the first quarter of next year, Dex said.

Neck and neck

Both AT&T and MCI are hard at work pushing their frame relay networks out to reach remote and mobile users.

	AT&T	MCI
Dedicated speeds	56K bit/sec, T-1	56K bit/sec through T-1
Dial-up speeds	14.4K bit/sec	28.8K bit/sec
ISDN	Q4	H1 1996
PPP/Protocols supported	Q4 /Unannounced	Now/IP; Q2 1996/IPX, SNA
Cellular	Not available	Q1 1996
X.25 translation services	Domestic, international	Domestic, international

The service is already available for its X.25 network.

This type of access targets mobile users who need LAN resources on a frame relay internetwork but are not always in the vicinity of a wired phone line.

Sazegari pointed out, though, that wireless links to frame relay can be a double-edged sword. Frame relay operates on the assumption of clean, reliable underlying links and thus eliminates the error-correction function to boost efficiencies.

Wireless links, however, are inherently unreliable, and "carriers must introduce good error correction for wireless," he said. The overhead associated with error correction on the wireless links could thus counteract the efficiencies of frame relay, he said.

AT&T declined to comment on its wireless access plans. ■

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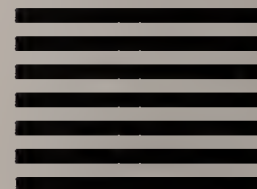
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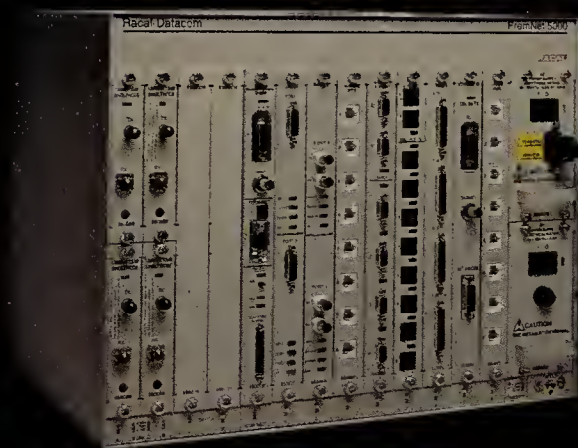


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Communicating through technology

Half full or half empty?

Roughly half the states require that LECs interconnect their networks with certified competitors, a significant hurdle to clear before local phone competition can prosper.

■ = States requiring interconnection

GRAPHIC BY TERRI MITCHELL

SOURCE: NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS, WASHINGTON, D.C.

States want to drive local phone competition

By Tim Greene
New Orleans

The move to local telephone competition is in an ugly "sausage-making" phase. But this can be tidied up considerably by state regulators acting in the right way, according to potential competitors and the state regulators themselves.

So far, about half the states require that the dominant local exchange carriers (LEC) interconnect with competitors' networks, but that is still a long way from insuring competition, state regulators were told here at the recent National Association of Regulatory Utility Commissioners (NARUC).

LECs can throw up countless roadblocks and drag their feet in the absence of coaxing and prodding from state regulators, according to officials from competitive access providers.

Thomas Morrow, president of Time-Warner Communications Corp., said many LECs are making a legal issue at every turn — over interconnection, rights to phone numbers, unbundling the local loop and more. "And the LECs don't need to win those battles," he said. "They win simply by forcing the competition to waste lots of time in fighting each stage of the way while they strengthen their positions."

But things can be done faster and more amicably. Royce Holland, president of MFS Communications Company, Inc., said that in the company's first venture into local service four years ago in New York, it had to pay more than 100% of the revenue it took in from local calls to NYNEX Corp. in order to terminate those calls.

Now MFS has cocarrier status as well as an agreement for terminating calls to and from other

networks on a reciprocal basis, and it can buy just those portions of local-loop access that it absolutely needs.

The difference between then and now? The aggressive involvement of the New York Public Services Committee, according to Holland, which wanted competition and forced the parties to stick with it until they worked it out.

"Bad things that happened in New York weren't the result of NYNEX trying to make it bad. It's a sausage-making process," Holland said.

Morrow said that in some states, financial arrangements were dictated by legislation and that LECs fought for the right to view the Time-Warner network at the expense of Time-Warner being able to monitor it itself.

Feds to states: Wake up!

State regulators also got a wake-up call from the federal government.

David Turetsky, U.S. deputy assistant attorney general, said states need to police whether regional Bell operating companies are unbundling access to local-loop components so competitors can connect to LEC networks at lower costs. They also need to monitor whether RBOCs direct local long-distance calls to competitors' networks without forcing users of the alternate service to dial extra numbers.

That kind of monitoring cannot be done effectively from Washington, D.C., he added.

NARUC also recommends that its members deal with legislators in their home states to push for laws that go beyond allowing competition to requiring that LECs to cooperate with interconnection. ■

Hypercom

Continued from page 17

version, and 1996 will be even bigger. We see far more users trying to get the most out of what they have today and trying to save for the more advanced technologies they'd like to have in the future.

P. Wallner: Technologists at companies never got very excited about frame relay, but the CFOs at companies sure did since many of them could see savings of up to 40% or more.

Are there areas you intend to exploit in 1996?

G. Wallner: We'll be supporting APPN more but in a realistic fashion. We don't think a Network Node belongs in a branch net; it's too complicated. Our central-site systems will retain the power of a net node. Plus, we'll be building our own APPN code and implementations.

Isn't that costly? Why not buy IBM or Data Connection, Ltd.'s (DCL) code and work from that?

G. Wallner: Well, we've always written our own SNA code, so we feel we have the expertise needed to build the APPN code and products. We didn't want to get into the politics of choosing IBM or DCL.

P. Wallner: We'll make sure we are legally in the clear and do all the necessary testing to ensure interoperability, as well.

G. Wallner: We'll also be looking to support ATM when necessary and, obviously, we will continue to improve our frame relay support. On ATM, we see a need for it but not much demand. Branch office connectivity, which will continue to be our central focus, isn't ready for an ATM revolution just yet. Frame relay is what those users are excited about.

Why do you feel your company is particularly well suited to

compete with the likes of Cisco and others with a strong interest in this market?

G. Wallner: Market leadership in the TCP/IP world doesn't translate easily into market leadership in the SNA world. Vendors promoting TCP/IP encapsulation for SNA — that's just not a good solution for SNA users. Most of the battles Cisco will face will be internal. They have been very successful in the TCP/IP world, so it'll be hard for them to convince others inside the company and users they can be successful in the SNA world.

P. Wallner: We will continue to focus on the branch office connectivity world. Efficient branch office communications are, in many cases, the most costly part of the SNA users' enterprise. With our combination of technology in the Integrated Enterprise Network line, we offer a broader scope of options than our competitors, which are only now discovering this market. ■

INTERNETWORKING MONITOR

Is ATM a synonym for fast?

Some people seem to think that I'm anti-ATM. I guess that comes from the fact that I have often expressed the view that ATM is an answer but not the answer to the future of data networking.

Please understand that I do not say "data networking" to reduce the extent of the application of this type of technology. However, I feel that within the next five to seven years, the phone companies will have to transition from today's environment, where to them data is a special case of voice, to a new environment where voice will be a special case of data.

Keep in mind that when I say data, I include everything from text files to video.

I think there will be reasons to use a variety of data networking technologies in the future. The big players over the next five years will be 10Base-T and 100Base-T Ethernet, frame relay, ATM and SONET. I also expect that a next-generation networking technology, which many in the trade press will label as ATM's successor, will start to be identified in about the same time frame.

My logic may not help to dissuade those of you who dismiss me as some heretic, but here goes.

When is ATM not ATM?

I've started to notice an interesting trend. I do quite a bit of consulting and often get asked to review organizations' networking plans. More and more of these plans are talking about ATM — without talking about ATM.

They talk about "planning for ATM," or "getting ready for ATM" or "keeping ATM in mind." But when you start talking details, it turns out that many of them are not actually talking about ATM because of its planned ability to control quality of service or because the organizations see a general

requirement for real-time applications like desktop videoconferencing.

They are using the term ATM as a synonym for fast. Clearly, there are expectations in some environments for real-time applications, but most of the people I'm talking to these days are looking for speed and, perhaps, the ability to create VLANs.

They see a need for fast networking technologies in the future, and the one that is on the tip of everyone's tongue is ATM. But this is not because of any characteristic of ATM other than the widely touted transfer speed and some often vaguely understood ability to create LANs not limited in physical configuration.

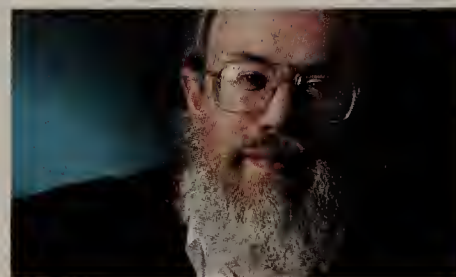
Sure ATM can go faster than OC-3, but OC-3 (and even slower) speed ATM is what is affordable, or at least can be predicted as becoming affordable in the near-term. And OC-3's 136M bit/sec or so payload capacity is not much different from 100M bit/sec fast Ethernet.

There are a growing number of 100M bit/sec Ethernet switches. Some of these (with more coming) already support some form of virtual LANs and full-duplex data paths. These devices are providing network planners with what many of them need from ATM without them having to leave their comfortable Ethernet environments.

I'm not sure exactly what this portends. It does seem to me that some chunk of ATM's customers, at least potentially, may disappear by the time ATM is ready to support them.

Disclaimer: The quality of Harvard's service is excellent, of course, so any discussion involving it must reflect my own opinions.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.



Scott Bradner



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Briefs

■ **Novell, Inc.** has announced an agreement with **Stellar One Corp.** to integrate Nested NetWare with the latter's set-top boxes. The Stellar 1000 set-top boxes are designed to provide a low-cost front end to NetWare networks using cable TV, telephone or cable lines as access methods. While the boxes will be available in 1996, Novell and Stellar One are still lining up service providers that would give users home access to networked applications such as electronic mail, live video or pay movie transmission, and access to home devices such as alarms.

Novell: (800) 638-9273; Stellar One: (206) 467-8571.

■ **AGE Logic, Inc.** of San Diego has released Version 3.1 of its XoftWare for MacOS, a multisession X Window System server software package that comes bundled with SLIP and PPP access software, as well as a File Transfer Protocol client. The software gives Macintosh systems access to graphical Unix programs and the Internet. It also adds support for multiple Unix host and user authorization methods, including xhost and xauth.

XoftWare for MacOS 3.1 costs \$295 for a single-user license. Also shipping for \$395 is a Connectivity Bundle that includes XoftWare and AGE's PacerTerm VT420 terminal emulation software.

AGE Logic: (619) 755-1000.

■ **Pinnacle Technology** has announced Desktop Observatory 4.0, management and security software for OS/2 desktops.

With the product, network administrators are able to give OS/2 users access to their desktops from wherever they log on. The software will also let administrators restrict use of net resources, such as certain Internet areas, by user or group.

The software is priced at \$179.

Pinnacle Technology: (800) 525-1650.

Outsourcers provide remote LAN access relief

By Michael Csenger

One of Woody Benson's biggest customers doesn't ever want to buy another LAN Rover from Shiva Corp.

"They want to get all our equipment and all the manage-

ment of it in an outsourced deal through their carrier," said Benson, senior vice president of worldwide sales and marketing at Shiva, a pioneer and market leader in remote access servers.

Finding remote LAN access

to be an expensive and time-consuming process to manage, a growing band of companies is handing over the task to outsourcing firms.

Companies willing to take over the chore include big-name carriers such as MCI Communications Corp., Sprint Corp. and some of the regional Bell operating companies, as well as a handful of lesser known outfits, including New England Systems (NES) and Acsys, Inc.

The market for remote LAN access products is booming as a result of companies looking to give mobile and remote end users a reliable connection into corporate LAN resources. Re-

problems because the central MIS is either not staffed to provide the support or doesn't have an interest in it."

That's where a group of carriers and outsourcing firms are stepping in. MCI, Sprint and others are starting to build the infrastructure to provide remote LAN access services as another variable-cost offering tacked onto monthly phone bills.

Outsourcing organizations

More immediately, however, NetSolve of Austin, Texas, NES of Waltham, Mass., and Acsys of Burlington, Mass., have added or will add remote LAN access to their outsourcing services.

Big Six firm is counting on ATM for applications success

By Michael Csenger

Radnor, Pa.

Big Six accounting firm KPMG Peat Marwick is trading its beans for bits to learn new ways of doing business over ATM-based networks.

At its U.S. headquarters here, the firm has installed an Asynchronous Transfer Mode backbone that carries the office's

daily production traffic and serves as a research and development skunk works for proving out new business applications.

The R&D is conducted by the company's Enterprise Networks consulting practice and its Enabling Technologies practice, more of a behind-the-scenes band of gurus. Enabling Technologies uses the ATM network to link the firm's switched and shared-media LANs, while Enterprise Networks uses it to showcase new technologies and help model the application environments of its clientele.

Health care is one of KPMG's five main market sectors and is the first prototyping environment being tackled by Mark McElroy, KPMG's partner in charge of Enterprise Networks.



McElroy has had no significant problems so far.

See KPMG, page 31

Sparrow apps tool takes flight

Offering provides OLE interface to Banyan's StreetTalk.

By Kevin Fogarty

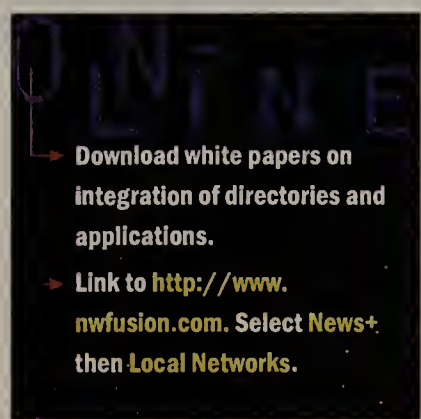
New York

Sparrow Software Technologies, Inc. has announced a product designed to make linking desktop applications with back-end directories as easy as writing a macro.

The company's @Easy offering is an OLE interface for Banyan Systems, Inc.'s StreetTalk directory, a distributed database containing logon and security information about users and resources across a network.

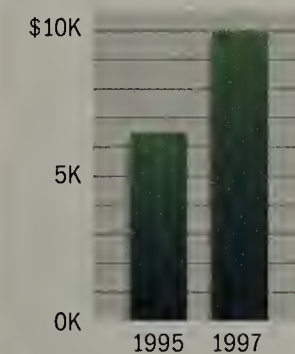
Net managers could use the product to automate administrative tasks such as disk allocation.

For example, using Microsoft Corp.'s OLE-compliant Visual Basic development tool, net managers could write an application. See Sparrow, page 28



WHY TO CONSIDER OUTSOURCING

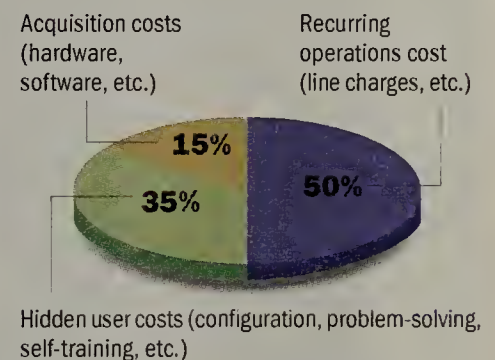
Annual remote LAN access costs (not including hidden support costs) per mobile worker are steep and climbing...



* Based on 161 organizations with an average of 544 remote access users.

GRAPHIC BY TERRI MITCHELL

The average real cost of remote LAN access in 1995 per company* will total about \$4.79 million. Here's how that total breaks down:



SOURCE: INFONETICS RESEARCH, SAN JOSE, CALIF.

remote access budgets to date have been defined mainly by purchases of ISDN and other phone services, as well as do-it-yourself remote access servers that bundle multiple modems.

But in a recent study of 161 organizations that have implemented remote access, Infonetics Research, Inc. of San Jose, Calif., found that 35% of the total cost is hidden away in nonbudgeted costs related to network administration and support.

"We found that over 85% of remote site management is done by the people at the remote site—the problems are falling to the people who are having them," said Michael Howard, Infonetics' president. "They are not people trained or paid for this work, but they have to spend their time resolving network

NetSolve is ramping up a remote LAN access service as an extension of its ProWatch WAN management service. NetDial, the remote access offering, simply extends NetSolve's traditional outsourcing arrangement to dial-up connectivity devices such as remote access servers and modem pools.

"Ours is specifically an add-on service to something that customers already have going with us," said Michael Turner, NetSolve's vice president of marketing. "It's really quite inexpensive to add on if we're already managing their WAN."

NES and Acsys are going after a new customer base, but they package their offerings somewhat differently.

NES offers a service called InfraMax, which involves real-

See Outsourcers, page 28



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Solutions for a small planet™

AST initiates NOS installation kit for servers

By Ben Heskett
Irvine, Calif.

AST Research, Inc. has introduced a CD-ROM-based server start-up tool similar to Compaq Computer Corp.'s SmartStart and Hewlett-Packard Co.'s NetServer Navigator offerings.

AST Initiate, which will be packaged with every AST server beginning in the first quarter of 1996, promises installation of Novell, Inc. NetWare or Microsoft Corp. Windows NT in less than 30 minutes. Currently, installing NetWare on an AST server can take as long as 4 hours.

Increasingly, vendors are trying to differentiate their hardware with integrated

management tools. In the case of AST, it is what the Irvine, Calif.-based company is not offering via Initiate that may be most telling, according to one analyst.

"They're doing a good job with configuration and installation software," but they need to add more network management products, said Susan Frankle, an analyst with International Data Corp., a Framingham, Mass.-based consultancy.

AST does offer a server management product called Percepta, but it does not have a very high profile.

Initiate studies the hardware of the server and installs the operating system in an optimal configuration.

Initiate also provides maintenance features if the server or network operating system (NOS) is reconfigured. The NOS installation does not have to start from scratch because the operating system configuration can evolve with changes to the AST hardware.

Initiate works not only with NOSes optimized to run on AST servers, but also with shrink-wrapped NOSes. So its functionality is not necessarily tied to a specific number of user licenses or the manner in which customers buy their NOSes.

Initiate is part of a broader support package that AST will unveil early in 1996.

©AST: (800) 876-4278.

Sparrow

Continued from page 25

tion that would query StreetTalk for all users matching a particular job title. The application could then use StreetTalk's net management features to automatically change the amount of disk space available to those users, Sparrow officials said. Users previously had to write code in C or C++ to access information stored as StreetTalk attributes.

The product accomplishes, on a basic level, integration between applications and StreetTalk that Banyan has been trying to deliver on a grander scale. Banyan is promoting StreetTalk as a standard directory for all desktop and networked applications. It is giving away versions of the directory and a development kit to encourage corporate and commercial software developers to build StreetTalk into their products.

Sparrow's offering may not help Banyan overtake the momentum of rival Novell, Inc., which is lining up commercial software developers to support its NetWare Directory Services. But @Easy should make it simpler for Banyan users to make better use of the information in their directories, observers said.

@Easy also beats to market Microsoft Corp.'s bid to link multiple directories using an OLE-based synchronization gateway called Open Directory Services Interface (ODSI). The first components of ODSI are not due until sometime in 1996.

@Easy is due to ship Nov. 30 with a predefined set of macros and Visual Basic code that can serve as examples of how to use the product. It runs on either VINES or Enterprise Network Services networks.

The price of the first version of @Easy installed at a user site is \$495, with subsequent copies priced at \$49.95.

©Sparrow: (212) 554-7838.

PLENTY OF PLATFORMS

Banyan's StreetTalk directory runs on VINES, HP-UX, Solaris, SCO Unix and NetWare, and a Windows NT version is on the way.

Outsourcers

Continued from page 25

time monitoring of remote access servers, remote office routers, and all the connectivity devices linking them to end users and the corporate LAN. When problems arise, NES will troubleshoot and fix them according to the nature of the problem and a well-defined service contract, said Peter Cowie, NES president and chief executive officer.

Acsys deals with remote management

more from the end user's side of a net.

"We start at the help desk and work up to the WAN," said Mark Williams, product manager for Acsys' NetGain Service. "The faceplate of a bridge or router at the central site is our point of demarcation."

While servers and routers do sometimes fail, end-user problems account for most of the time involved in supporting remote access networks, Williams said. Typical problems are that applications do not work on-line or users have trouble getting communications software properly configured, he said.

NetGain Service's help desk personnel use Microsoft Corp.'s Systems Management Server systems management software to connect to an end user's PC, take it over by remote control and work out whatever problems the user is having.

"We target remote sites so we don't get involved in corporate human resources issues," Williams said. "Outsourcing is typically a way of replacing people, and we don't want to deal with that. We see ourselves as an extension of the corporate MIS department, and remote access is one place where there's a very pressing need for that kind of relationship."

The company offers the same sort of management service for central site remote LAN access gear but is just not pushing it, he said.

Giving it a try

Convincing MIS managers to go with outsourcing is one thing, but the final payback will depend largely on end-user acceptance, as well.

Silver Platter Information, an information services provider based in Norwood, Mass., outsourced its 150-node network — including remote and mobile links — to Acsys in September. The initiative was handed down from Silver Platter's executive team, which sought to reduce MIS personnel from 12 to two.

"Overall, it's worked pretty well, though there doesn't appear to be a real drastic cost savings," said Wayne Hetherington, Silver Platters' IS support manager. "Even though we eliminated 10 people, Acsys is fulfilling the role of about four, and the two of us who are left handle a lot of the rest."

"One of our difficulties is the fact that old habits die hard," Hetherington said.

Company: AST Research

Product: AST Initiate

- Features:**
- ▶ Promises NetWare installation in less than 30 minutes.
 - ▶ Installs operating system in optimal configuration.
 - ▶ Does not require reloading NOS from scratch as system bugs are worked out.
 - ▶ Contained in every AST server.

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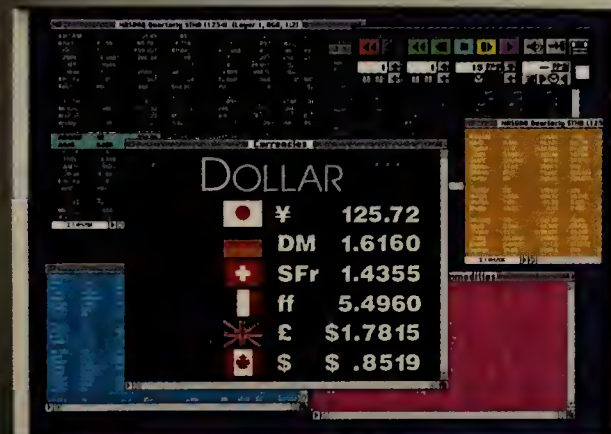
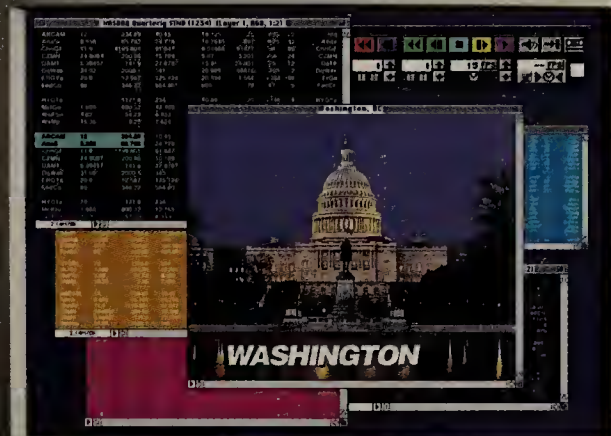
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COMMENTS?

See "How to reach us" on page 5.



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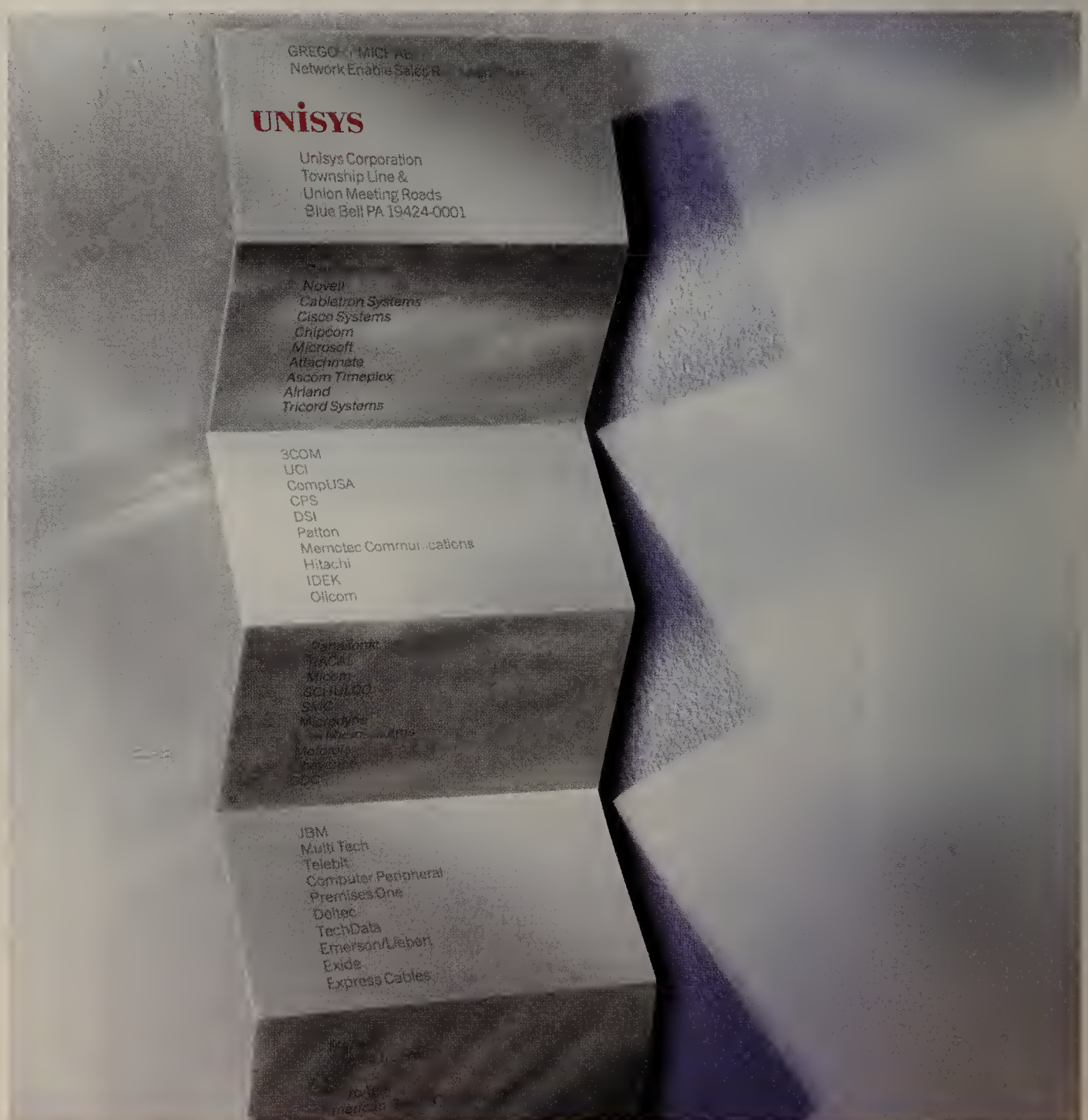
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network let you perform
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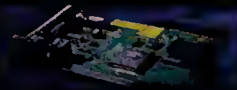
Does it let you add and
and networking functions
you need



*Customer must submit registration card for lifetime warranty to apply. Advance hardware exchange available during first year; thereafter return hub to 3Com. Power supply and fan warranted for one year only. Lifetime



subtract users
when and where
to?



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STACKABLE SOLUTIONS REMOTE ACCESS SOLUTIONS SWITCHING SOLUTIONS



Does it let you divide your
capabilities among your remote
having to increase support

WORKGROUP SOLUT



INTERNET ACCESS SOLUTIONS WAN BACKBONE SOLUTIONS IBM/SNA SOLUTIONS NE



network's
sites without
staff?



REMOTE OFFICE

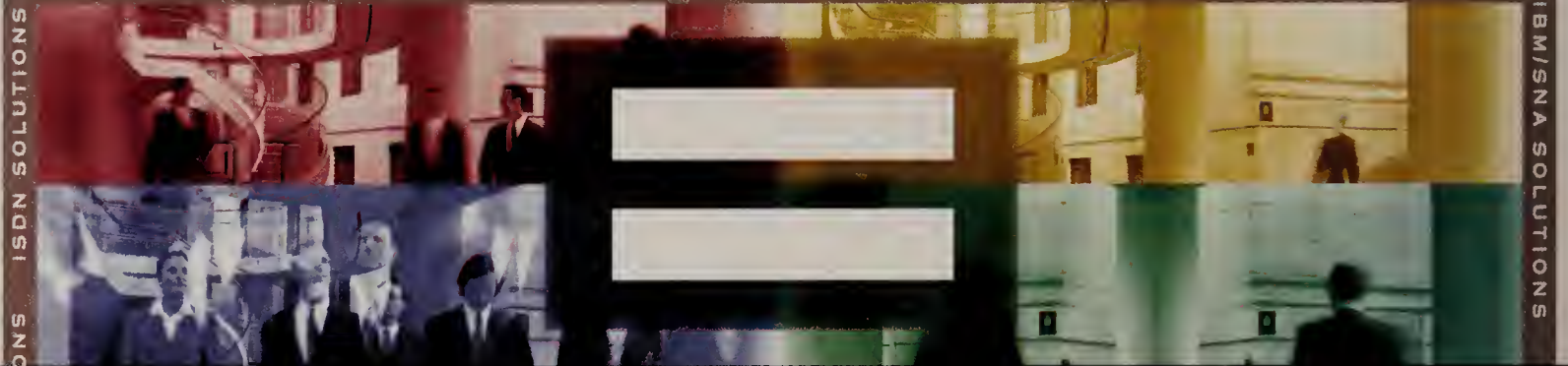


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What you'll be getting is more control and more flexibility. Installation and configuration are plug-and-play and integration is smooth with central office resources. With our Transcend management software, you'll be able to manage everything from a centralized location. You can even add the reliability of backing up with our Redundant Power System. And since 3Com is a networking leader, you can count on service, support and reliability. So there you have it. Functionality, control, reliability. When it comes to the 3Com SuperStack system, you do the math.





SuperStack products at a glance

(For a closer look, call 1-800-NET-3Com)

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3Com's industry-leading wiring hubs bring proven performance to a stack. Optional slide-in modules are available for network segmentation and advanced management functionality.

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- LinkBuilder FMS II TP (12- or 24-port)
- LinkBuilder FMS II Fiber
- LinkBuilder FMS II Telco
- LinkBuilder FMS II Management Module
- LinkBuilder FMS II Bridge Management Module
- LinkBuilder Bridge MicroModule

Fast Ethernet

- LinkBuilder FMS 100
- LinkBuilder FMS 100 Base TX Transceiver Interface Module
- LinkBuilder FMS 100 Base FX Transceiver Interface Module

Token Ring

- LinkBuilder FMS TR (12- or 24-port)
- LinkBuilder FMS TR RMON Management Agent Module
- LinkBuilder FMS TR Advanced RMON Management Agent Module
- LinkBuilder FMS TR Fiber RI/RO Module
- LinkBuilder FMS TR Copper RI/RO Module
- LinkBuilder FMS TR Copper/Fiber RI/RO Module

SWITCHES

Switches boost performance in Ethernet LANs with a choice of Fast Ethernet, FDDI or ATM connections.

Ethernet

- LinkSwitch 500 (Ethernet only)
- LinkSwitch 1000 10-100 (Ethernet to Fast Ethernet)

LinkSwitch 1200 (Ethernet to FDDI)

- LinkSwitch MSH Module

LinkSwitch 2200 (Ethernet to FDDI)

LinkSwitch 2700 (Ethernet to ATM)

LinkSwitch 3000 (Fast Ethernet)

Token Ring

LinkSwitch 1000 TR (TR only)

- LinkSwitch 1000 TR FDDI Module
- LinkSwitch 1000 TR TM Module

REMOTE ACCESS SERVERS

Remote access servers extend full network access to remote users dialing into remote office and workgroup LANs.

Ethernet

- AccessBuilder 2204 (4 port)
- AccessBuilder 2208 (8 port)

ROUTERS

Low-cost, high-functionality routers simplify remote site connections.

Ethernet

- NETBuilder Remote Office 221(BR)
- NETBuilder Remote Office 222 (IP, IPX)
- NETBuilder Remote Office 223 (SNA) (BR)
- NETBuilder Remote Office 224 (IP)
- NETBuilder Remote Office 227 (all protocols)
- NETBuilder Remote Office 228 (connection services)

ISDN

- NETBuilder Remote Office 421 (BR)
- NETBuilder Remote Office 422 (IP, IPX)

NETBuilder Remote Office 423 (SNA) (BR)

NETBuilder Remote Office 427 (all protocols and WAN services)

NETBuilder II WAN Extender 2T1

NETBuilder II WAN Extender 2E1

SDLC Converters

SNA-to-LAN converters cost-effectively link remote offices to the SNA host system.

Ethernet

- LinkConverter™ 250
- LinkConverter 251

Token Ring

- LinkConverter 350
- LinkConverter 351

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KPMG

Continued from page 25

"Our job is to create a health care environment of the future, built around new applications that aren't viable in today's environment but that will surely come to change the way the medical industry does business," he said. "We probably can't simulate a full-blown hospital network, but we have enough tools to demonstrate more than desktop video across an ATM LAN."

KPMG has started mocking up a Windows-based clinical information system that includes historical patient data and real-time imaging shared among different physicians located miles apart, with a videoconference going on between them.

"Our clients want to see how the billing system ties into it and the nurses' station. Our job is to simulate that total environment before it becomes available so we can identify the demands on the infrastructure and develop what ultimately become mainstream applications," McElroy said.

KPMG will also explore applications for the financial services, manufacturing and communications/entertainment sectors.

What's underneath

KPMG's combination production and experimental network is based on ATM and Ethernet switches from Whittaker Corp., which acquired the products when it bought Hughes LAN Systems, Inc. earlier this year.

ATM was essential for the multimedia-intensive types of applications that KPMG will develop. McElroy settled on the Whittaker/Hughes LAN Systems products because they do not rely exclusively on ATM. Instead, they support other protocols and switched net technologies that might be needed to meet different application requirements.

The network performs so well that it has brought out the shortcomings of other ancillary hardware.

The Whittaker Enterprise Hub 1000 uniquely supports ATM and switched and shared Ethernet on the same backbone, which is based on a proprietary cell-switching scheme. It can accommodate any LAN protocol through standards-based interface modules, which gives the hub the flexibility to provision different services as needed. That means KPMG can retool the switch day-to-day, as clients come in for entirely different R&D demonstrations.

For internal purposes, KPMG's office here has about 700 devices attached to five different virtual LANs, all feeding into a core backbone of three Enterprise Hub 1000s. Those hubs are configured with a mix of Ethernet switching modules, shared Ethernet hub modules and ATM modules that shuttle traffic across the chassis. Several routers are attached to

the backbone for wide-area access and routing between VLANs.

VLAN capabilities were critical to KPMG's design as a way to ease network administration. VLANs allow the logical grouping of network devices, regardless of their physical location. And that fits well with the virtual office policy, also called hoteling, that KPMG instituted about 18 months ago.

No permanency

"What it means is that nobody has their own office — the offices get assigned temporarily when we're here, but most of the time, we're not," McElroy said. Tele-

commuters and mobile consultants have access to their VLANs over dial-up links that are ultimately ATM-attached. "My remote access traffic from home gets carried as ATM cells back at the office," he said.

The initial deployment and early ramp-up have been eerily smooth, with no ATM congestion problems or interoperability snags.

"We're converting frames to cells for all of our conventional LAN traffic; we're running multimedia voice, data and video over the backbone. We haven't experienced any significant problems," McElroy said. "We haven't been overly careful

about it, either. We haven't consciously steered away from generating large bursts of volume."

In fact, the network performs so well that it has brought out the shortcomings of other ancillary hardware. In videoconferencing, for example, the bottleneck has shifted from the original switched LAN to the video cameras themselves — the cameras' ability to digitize traffic fell below the network's response time. So the video system cannot take advantage of 150M vs. 10M bit/sec even when the fatter pipes are available.

Csenger is a contributing writer to Network World.

Business Briefs

TCP/IP stack and Internet connectivity vendor **NetManage, Inc.** has signed an agreement to acquire **AGE Logic, Inc.**, a San Diego-based vendor of X Window Server PC-to-Unix connectivity products. NetManage, based in Cupertino, Calif., said the deal will bolster its product line so that it can offer tools for accessing not only the Internet, but also corporate net resources. Terms of the acquisition, which should be finalized by year-end, were not disclosed.

Digi International, Inc. has signed an OEM agreement with **Novell, Inc.** under which Digi will integrate its connectivity hardware with Novell's NetWare Connect 2.0 remote connectivity software and MultiProtocol Router 3.0 router. Digi also will resell the Novell products with its

LAN access products, which support frame relay, X.25, PPP and ISDN connections to NetWare servers.

The founders of Bridge Communications, Inc. and Network Computing Devices have reemerged with a new venture, **Precept Software, Inc.**, to develop multimedia networking software.

Judy Estrin and Bill Estrin Carrico have raised \$5.5 million in a second round of private financing for the Cupertino, Calif., start-up. Their software will be based on Microsoft Corp.'s Windows 95 and support packet-switched networks.

UB Networks, Inc. has promoted **James McCormick** to vice president of finance. Previously, he was the hub and switch maker's director of financial planning and analysis.

In his new job, McCormick will be responsible for integration and management of financial and accounting activities.

Novell, Inc. last week announced the resignation of **Bruce Bastian** from the company's board of directors. Bastian, cofounder of WordPerfect Corp., joined the board when Novell bought WordPerfect last year.

His departure — to "follow other interests," as Novell put it — follows the company's decision to sell off most of its WordPerfect applications.

NET RESULTS

Novell's viability in an increasingly NT world

We had the pleasure two weeks ago of jetting halfway around the world to attend Gartner Group's annual Pacific Symposium in Queensland, Australia. The trip was not only educational (we discovered, for instance, that koalas are bears rather than marsupials, and Rachel Hunter is from New Zealand, not Australia), but also afforded us the opportunity to interact with network professionals from several Pacific Rim countries.

What we found is that these users are dealing with many of the same network concerns and problems as

the rest of the world: migrating from SNA to client/server-based LANs, moving to ATM and building more comprehensive network management schemes, to name a few.

But if we look at their top networking problem, all we see is red. Novell, Inc.'s long-term viability was a major

concern for many of these users, especially in light of the momentum that Microsoft Corp.'s Windows NT Server has enjoyed of late.

Novell has all but admitted that it lost the application services battle to Microsoft, deciding instead to work with both The Santa Cruz Operation, Inc. (SCO) and Hewlett-Packard Co. on the delivery of Unix-based application platforms. But Novell is far from dead, and it's betting on its NetWare Directory Services (NDS) as its vehicle for full recovery.

NDS will become Novell's key differentiating factor in the network operating system (NOS) market, mainly because it's something Microsoft doesn't have yet — a comprehensive directory service. Since NDS is only available on the NetWare 4.X platform, Novell is using aggressive pricing to move NetWare 3.X users to 4.X, which will be the only platform Novell develops for and enhances in the future.

In order to further the NDS cause, Novell will also roll out a number of NDS-based features, including the NetWare Connect Services project with AT&T and its Nested NetWare product.

Despite its efforts with SCO and HP to drive acceptance of NDS, Novell still has much to do to increase

NDS' attraction and draw users toward NetWare as their NOS of choice in the future.

Novell will not attempt to port NDS to other platforms as Banyan Systems, Inc. originally did with its Enterprise Network Services. Instead, it will focus on licensing the technology to more independent software vendors as well as the big systems vendors such as IBM.

Despite these efforts, Novell knows it cannot afford to completely ignore NT. The company has talked about — in rather vague terms — its NetWare AppServer Manager product. It will be agent software for NT Server that will help users integrate NDS into the environment.

We expect Microsoft will deliver similar functionality even sooner than Novell, however. The Microsoft product is actually in beta right now.

Is Novell in trouble? In some areas, absolutely. We expect it to actually lose market share in the NOS area over the next three years to NT, even as Novell starts to deliver on some of its initiatives with SCO and HP.

Novell CEO Robert Frankenberg has done a decent job so far in getting Novell refocused on its core competencies and strengths. Much work is left to be done, but users can rest assured that Novell will remain a force in the NOS marketplace.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.



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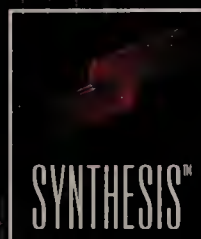
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Briefs

■ The Database Solutions

Co. in Richmond, Va., is now shipping Configuration Manager, the newest module in its Control Center client/server monitoring suite. The product optimizes database and hardware configurations, considering memory, CPU and disk I/O.

The Windows-based software costs \$995 for a single-user license and works with several relational databases.

Database Solutions: (800) 933-7668.

■ Last week, **Quadratron Systems** of Cologne, Germany, and Westlake Village, Calif., announced O3sis Intelligent Teamwork, a client/server groupware suite that includes word processing, electronic mail, database, fax and document management capabilities. An object request broker manages objects and messages between the software components.

The software runs on Windows and OS/2 clients, as well as Unix servers. Pricing was not available.

Quadratron: (818) 865-6655.

■ Maynard, Mass.-based **Digital Equipment Corp.** has unveiled three software products aimed at helping firms exchange and manage data across heterogeneous electronic mail systems.

MailBus 400 SMTP Gateway 2.0 for Digital Unix, which supports Multi-purpose Internet Mail Extensions, facilitates the transfer of documents between Internet and X.400 mail systems. It costs \$7,889, and a documentation kit costs an additional \$564.

SNADS Gateway for MailBus 400 1.0 permits users of Digital's messaging products to connect with mail systems based on IBM Systems Network Architecture Distribution Services. It costs \$20,000.

X.500 Information Manager 1.0 provides a graphical interface that lets end users modify and create directory entries from Intel Corp.-based desktops running Windows 95 and Windows NT. It costs \$600 for a single-user license.

Digital: (800) 344-4825.

Red Brick builds new data warehouse

Version 4.0 includes bitmap indexing, which challenges Sybase and other competitors.

By Barb Cole

Los Gatos, Calif.

Red Brick Systems, Inc. this week will announce Version 4.0 of its data warehouse offering, which includes new indexing technology for speeding up large queries made across a network.

Red Brick Warehouse 4.0 exploits what the company calls TargetIndex technology, which uses bitmap indexes to quickly locate information.

The offering also supports a new indexing feature, dubbed Attributes, which enables end users to ask more complex questions of a warehouse without

generating a lot of net traffic.

For example, instead of having to search out all the female doctors in a database and then perform another query to determine how many of them are between 35 and 50 and single, end users can mine out all that information with only one trip to the warehouse.

Data warehouses are storehouses of corporate data that are mined with a variety of front-end applications by end users.

Sybase, Inc. is expected to ship bitmap technology similar to Red Brick's with Sybase IQ, query acceleration software due during the first quarter of 1996.

Unlike Sybase's bitmap indexes, which will be sold as an add-on to the company's SQL Server database, Red Brick's TargetIndexes are integrated with the database, said Ram Srinivasan, director of product marketing at the company.

Analysts said Red Brick

pushed hard to get its release to market in order to beat the No. 2 database maker to the punch.

"Red Brick is racing to stay ahead in the [data warehouse] feature race," said Wayne Eckerson, an analyst at Patricia Seybold Group, a market research firm in Boston. He said Red Brick, known for its high-performance database, is being squeezed by the entrance of the mainstream database makers into the warehouse arena.

Red Brick's users, however, said the niche database still delivers on data warehousing performance, whereas the relational giants cannot.

"Red Brick has one of the best data loaders around. We load about one million records every half hour," said Beji Varghese, manager of database marketing at Holiday Inns Worldwide in Atlanta, a beta test site for Red Brick 4.0.

See Red Brick, page 36

Iona release to unite OLE and CORBA objects

By John Cox

Dublin, Ireland

The next release of Iona Technologies, Ltd.'s object request broker (ORB) will forge two-way links across a network between OLE-compliant desktop objects and CORBA objects based on Iona technology.

The company's Orbix 2.0 ORB also will support interaction between OLE objects across a network. As a result, Orbix 2.0 will make it easier for companies to build distributed applications across multiple platforms.

Building bridges

The offering will give application developers a practical way to bridge the gap between OLE on Microsoft Corp. desktops and the Object Management Group's Common Object Request Broker Architecture, which is being deployed on a variety of Unix and host operating systems. And in establishing a link between OLE objects across a network, Iona beats Microsoft to the punch.

Earlier this year, Iona introduced Orbix support for OLE Automation, a set of interfaces that let OLE-compliant scripting languages, such as Visual Basic,

See Iona, page 36

Aurum turning the Web into a tool for customer service groups

By John Cox

Santa Clara, Calif.

Aurum Software, Inc. next month will begin shipping a software program to link electronic forms on Web servers with the customer database used by Aurum's sales and marketing applications.

The goal is to make it easier for companies to accurately meet the demands of their customers for information about pricing, products and technical support.

"Look at this from the standpoint of [a company's] customers," said Mary Coleman, president and chief executive officer of Aurum. "They can interact with their vendor anywhere, at any time. They can get faster delivery of goods and services, and solve their problems faster."

Aurum's new WebTrak Internet Marketing Module is an API and communications mechanism that lets companies create

HTML electronic forms on a Web server. When these forms are filled in by customers or prospects accessing the server, WebTrak translates this information into a format that can be read by and written to the Aurum customer database.

From there, Aurum's built-in workflow software can route the information to users of the company's TeleTrak telemarketing

or SalesTrak sales management applications (see graphic).

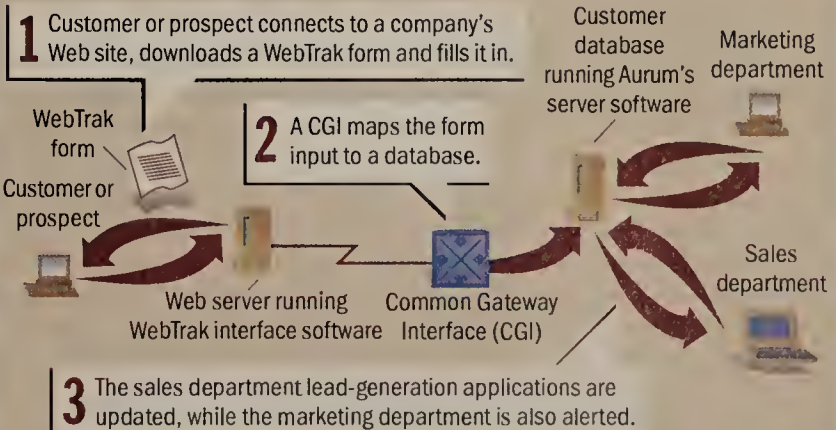
Later, Aurum will release a product to let customers interact via the Internet with their vendor's various customer service departments.

Aurum also will create tools to let companies build individualized Web interfaces for each of their customers. The goal is to create a one-to-one business relationship blended with electronic commerce capabilities.

WebTrak and the follow-on products represent a big change in how the Web is being used.

See Aurum, page 36

MAKING THE WEB INTO A SALES FORCE



GRAPHIC BY TERRI MITCHELL

RealityCheck

Product

Red Brick Warehouse 4.0

Company

Red Brick Systems

The benefits

- ▲ Extremely fast at loading data.
- ▲ Yields good query performance against large data warehouses.
- ▲ Runs on parallel processing systems.

The drawbacks

- ▼ Requires users to move operational data into another database for warehousing.
- ▼ Data replication sold as an add-on product.
- ▼ Not widely supported by popular management tools.

The user view

"The new bitmap indexing in Release 4.0 improves query performance almost 50% and uses up less disk space than the old-style indexes."

Beji Varghese

Middleware

Microsoft spec to give apps links to nonrelational data

By Barb Cole

Redmond, Wash.

Microsoft Corp. plans to put a kit for early adopters of its OLE/DB specification — a protocol for accessing nonrelational data from OLE-compliant applications — in the hands of independent software vendors (ISV) by early next year.

Sources close to the development effort said a full-blown software developers' kit (SDK) for OLE/DB is due next summer. But Greg Nelson, data access product manager at Microsoft, said there is not a firm schedule yet for the SDK.

Some software makers who attended a design preview for OLE/DB at Microsoft headquarters in October said the specification will offer application developers access to a breadth of corporate data, including word processing documents, spreadsheets, legacy data, World-Wide Web pages and other nonrelational information.

"OLE/DB-compliant applications will have stubs for bolting on widgets that, say, calculate a mortgage rate over 30 years or turn off a security system somewhere," said Brian Reed, a team member at Intersolv, Inc., a Rockville, Md., maker of Open Database Connectivity (ODBC) drivers.

ODBC is a Microsoft interface for connectivity to relational data.

"OLE/DB really strikes at corporate data requirements and migration of non-SQL data to SQL," said Russ Aldrich, vice president of marketing at Simba Technologies, Inc., a Seattle-based provider of ODBC middleware.

According to ISVs, Microsoft has been quiet about OLE/DB because it wants to avoid eclipsing Version 3.0 of the ODBC spec, expected to enter beta testing around December, sources said. A final version of the ODBC 3.0 SDK is expected in June. ■

Iona

Continued from page 35

make calls to a software program outside the OLE environment. Iona created a software layer over a CORBA object, which then appeared to be an OLE object to Visual Basic programs.

But it was a one-way, onetime OLE-to-CORBA call that had to be repeated to keep the OLE object making the call updated, according to Barry Morris, Iona's vice president of product development.

By contrast, Orbix 2.0 lets developers specify an object definition in the CORBA Interface Definition Language (IDL). Orbix then generates an OLE Custom Control, called an OCX, which can be incorporated in

Putting a new spin on Orbix

Product: Orbix 2.0 for Windows NT and Windows 95

What it is: An object request broker that links objects over a network.

What is new: Creates two-way link over a network between OLE objects or OLE and CORBA-compliant objects; relies on the CORBA-based Orbix run-time environment for connections.

How it works: Developer specifies object in CORBA Interface Definition Language; Orbix 2.0 generates the OLE Custom Controls (OCX), which can be included in Visual Basic 4.0 applications. OCXs can be called by server-based CORBA objects and vice versa.

any Visual Basic 4.0 application. The application is turned into an executable file, with the object being registered with the CORBA invocation mechanism.

"To the CORBA world, this OCX looks like a CORBA object, and to the OLE world, it looks like an OLE object," Morris said. The result is that objects running

under Orbix on a Unix server can call in to the world of OLE objects.

Orbix 2.0 is in beta test now and will begin shipping in December. On Unix, pricing is about \$5,000; on Windows NT, about \$2,500; and on Windows 3.1 clients, about \$999.

©Iona: (800) 672-4948.

Aurum

Continued from page 35

"Companies are using the Web [today] more for distribution of documents," said Barton Goldenberg, president of Information Systems Marketing, Inc., a Washington, D.C. consultancy. "What the Internet provides is a cost-effective way for people to get to your company. The tricky

part is linking the Web home page to the corporate systems. Aurum is one of the first to make this sort of offering."

Goldenberg is working with a leading oil company evaluating several customer management automation packages — including Aurum's offering — as part of a strategy to exploit the 'Net.

"They're looking at customers for their oil products and

want to link them via the Internet so they can order products," he said. "The company also wants to send out a disk to distributors so they can access the oil company's home page."

But, he cautioned, these kinds of relationships cannot be built by software alone. Companies need to work closely and plan carefully with their customers to make these relationships effective, Goldenberg said.

WebTrak will be available in December as an add-on product to SalesTrak or TeleTrak. It runs on most popular Unix-based Web servers, including Netscape Communications Corp.'s Netscape Commerce Server. Prices range from \$7,500 to \$10,000.

©Aurum: (408) 986-8100.

SHARED LOGIC

Messaging VANs have plenty to give thanks for

Food is on the brain. And after going on a binge this past Turkey Day, I began thinking about the messaging service provider market.

It was between the cranberry sauce and candied yams that I tried to get a grasp of where the whole messaging service provider market is going. After all, how long can you hear about Aunt Beatrice's goiter?

As recently as 18 months ago, many remote corporate personnel and small-business people needing messaging services would rely on carrier-provided electronic mail, such as MCI mail, AT&T EasyLink and SprintLink. But that was B.I. — before Internet.

Now these folks get E-mail for free from their friendly neighborhood Internet service provider. Furthermore, with emerging versions of Web browsers including more robust E-mail and even collaborative functionality (check out the Netscape Navigator 2.0 beta), the consumer portion of the carriers' mail business is sure to take it on the chin.

So what's a VAN to do?

In Darwinian fashion, they need to move up the food chain, so to speak. And to do that, they will attack the Internet where it's most vulnerable — in the security and reli-

ability areas.

For all its strengths, the Internet is not industrial-strength for true commerce applications quite yet.

Hold on a second. I don't want to miss the pumpkin pie....



Mike Rothman

Within my client base, there is a clear requirement for store-and-forward applications for interenterprise communications. EDI, workflow, forms and your other favorite message-transported applications will all require connectivity to trading partners, both large and small, within

the next 18 months.

Finally, it seems the carriers are willing to put their money where their mouths are. Integral to newfangled messaging services will be service-level agreements, guaranteeing a specific degree of reliability and performance. Very much like my trusty American Express card, I wouldn't leave home without one.

Yet that still leaves open the pricing issue, especially considering the relative cheapness of Internet mail.

Guaranteed service and reliability are pretty important, and I'd posit that most large organizations would be willing to pay extra for the peace of mind.

But they may not pay that much extra, which means the carriers' per-kilobyte pricing model won't survive.

Service providers must start charging for value. If you want to insure something you send through the U.S. Postal Service, you pay extra on a per-letter or package basis. Why wouldn't E-mail be the same way?

Also, look for service providers to focus on systems integration of the message-based interenterprise applications and to provide management and gateway services for existing LAN-based solutions.

MCI just acquired SHL Systemhouse in order to gain some implementation competencies, and most providers can offer messaging backbone services for heterogeneous networks via internally managed gateways.

Coincidentally, these services typically bring in much higher margins for the service providers than the core mail services do anyway.

So don't fret for the messaging VANs. Although they will not be able to eat the low-hanging fruit for much longer, they'll find hunting big game much more rewarding. And that's in keeping with the spirit of Thanksgiving, after all.

Rothman is a vice president in META Group, Inc.'s Global Networking Strategies service in Reston, Va. Feedback is welcome either by E-mail at MikeR@metagroup.com or by phone at (703) 860-6600.

Red Brick

Continued from page 35

Varghese said the new bitmap indexes improved query performance by as much as 50% on Holiday Inns' 120G-byte data warehouse, which includes information about customers, rooms and amenities guests used.

Red Brick Warehouse 4.0 also has improved data-loading technology.

The warehouse runs on a range of Unix and massively parallel processor systems, including those from AT&T Global Information Solutions, Digital Equipment Corp., HP, IBM and Sun Microsystems, Inc.

Available now, pricing for Version 4.0 starts at \$37,500.

©Red Brick: (800) 777-2585.

COMMENTS?

See "How to reach us" on page 5.

Messaging vendors still have their management work cut out for them

By Carol Sliwa

Two years ago, when Blane Woodard set up a nationwide electronic mail net for Northwestern Mutual Life Insurance Co., the choice of management tools was scarce.

So he took the same approach that many large companies did and developed his own tools. "I call it custom-designed management," he said.

Currently, Woodard's homegrown management system lets him monitor from the company's headquarters in Milwaukee 105 Unix-based Hewlett-Packard Co. OpenMail servers spread across the country.

Analysts said management tools from the leading E-mail vendors are satisfactory for small networks but still are not up to snuff for large ones. As E-mail networks expand to service tens of thousands of end users, vendors are constantly playing catch-up to meet their customers' needs.

"They're working hard at it, but they're moving too slowly," said David Ferris, principal of San Francisco-based Ferris Research, Inc.

Surveys show that administration and management remains one of the most important concerns for users. Among their key concerns are directory synchronization between different environments, making moves and changes easier, proactive problem identification, managing within heterogeneous environments and remote administration capability.

"The primary vendors have provided tools to try to make their LAN mail systems more manageable," said Daniel Blum, an analyst at the Maryland office of consultancy Rapport Communication. "Going forward, the big focus on management will be to upgrade the entire messaging infrastructure to a whole new generation of client/server messaging products."

Those E-mail systems will be more secure and reliable. Also, because servers will support

more end users, large E-mail systems will be easier to monitor.

At Northwestern, Woodard is proud of the fact that his company had the foresight to build a client/server-based E-mail network. If the company had opted for a traditional LAN E-mail system based on file-sharing technology, he either might be losing sleep scrambling to keep track of

less management," Blum said. He pointed out that each HP OpenMail server can currently support many more mailboxes than most other systems, which enables net managers to oversee a large E-mail net mainly by keeping an eye on a handful of servers.

"You don't have to be as good at management if you've got less servers, particularly if... you put them in one computer room... and you have a trained staff whose job is to watch them," said Alex Cullen, a principal consultant with Onsett International Corp. of Cambridge, Mass.

Microsoft not far behind

Although HP may have the edge right now, Blum predicts that Microsoft's Exchange Server will offer the strongest management capabilities when the product hits the market in the first quarter next year.

Exchange Server will include a built-in management tool that will allow network managers to oversee their systems from a central site.

Monitors can be set at points across the net to not only alert the manager to potential problems, but also restart servers.

One shortcoming is that Microsoft's messaging and messaging management products must be integrated with Windows NT, observers said.

"Lotus and Novell will have much better cross-platform capabilities," Blum said. "There's

version of GroupWise due out in early 1996.

With GroupWise, administrators can synchronize directories, for instance, with those in Notes or cc:Mail, according to Rob Steele, Novell's groupware product-line manager. "You add people to NetWare, you are automatically adding them to our [NetWare Directory Services]," he said.

Among the new features being introduced is active disk space management, which will enable servers to notify net administrators of problems when predefined "watermark

levels" are exceeded.

Lotus is offering an arsenal of messaging management products, including NotesView for its groupware product and cc:Mail View for its LAN-based E-mail product.

An option is third-party management tools, but customers are still pitching for better management tools from the major vendors.

"Good management is like good hygiene," Onsett's Cullen said. "You don't differentiate yourself with it because it's not the important criteria. People expect it." ■

MOST TIME-CONSUMING E-MAIL MANAGEMENT TASKS

- 1 Moves, adds and changes
- 2 Programming and utilities development
- 3 Ad hoc application usage questions
- 4 Finding missing mail
- 5 Installation and upgrades
- 6 Training
- 7 Troubleshooting problems at the desktop
- 8 Resolving invalid directory lookups
- 9 File conversions
- 10 Reinstating forgotten passwords

GRAPHIC BY TERRI MITCHELL SOURCE: FERRIS NETWORKS, SAN FRANCISCO

his network or wasting precious staff on mundane monitoring tasks.

HP in the lead

As far as the major vendors are concerned, the future of enterprisewide E-mail management will come through their groupware products: Microsoft Corp.'s upcoming Exchange Server, Lotus Development Corp.'s Notes and Novell, Inc.'s GroupWise.

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But until their newest products hit the streets, Hewlett-Packard Co.'s client/server-based OpenMail is regarded as the leader in management tools, according to analysts.

"Fundamentally, it's not that they do so much more to manage the messaging network as that they simplify it so that it requires

a trade-off for that. The way Microsoft is getting that strong manageability is by just supporting one server: NT."

Novell's GroupWise, for instance, runs not only on NetWare, but also on all the major network operating systems — except Windows NT. Novell will be porting it to NT with its new

Messaging management breakdown

The leading vendors of LAN and client/server messaging products are offering or have in the works a host of management offerings. Here's a summary of their strategic tools:

Hewlett-Packard Co.

■ OpenMail has a built-in management tool that provides information on message flow, problem locations and errors, and an application utility that facilitates adding, deleting and moving users, as well as changing directories.

■ OpenView, HP's network and systems management framework, includes OperationsCenter and AdminCenter components that permit management and administration of messaging environments.

Lotus Development Corp.

■ cc:Mail View is a message monitoring utility used for cc:Mail that checks post offices, router connectors and internal gateways, alerting administrators of problems and producing reports and charts with statistics.

■ Lotus NotesView is a graphical management product that lets administrators monitor and control enterprisewide Notes environments. It is built on SNMP and HP OpenView.

■ Lotus Messaging Switch (LMS) connects different electronic messaging systems. Lotus Messaging Manager controls the switch itself, while Mail Monitor is a stand-alone PC-based management tool for tracking messaging system components outside of LMS.

Microsoft Corp.

■ Microsoft Mail has built-in administration and management tools for monitoring and other functions, targeted at the components running on an individual server. It does not allow remote administration.


■ Mail Server 3.5 lets administrators manage message transfer agent and directory synchronization processes remotely through a multitasking message transfer agent for Windows NT.

■ Exchange Server, due out in the first quarter of 1996, allows for a single point of administration, tracking of individual messages, and proactive seeking out and correction of problems based on administrator guidelines.

Novell, Inc.

■ GroupWise provides customers with the ability to manage and administer their systems without going off-line. It monitors messaging components, enables directory synchronization and permits management of client defaults. Some servers work to correct their own problems.

By Carol Sliwa



Ah, the joys of networking.
Keeping up with standards.
Dealing with multiple protocols.
Connecting various OS's.
Enforcing high security.
Pity the person who has to
make it all work.

Oh. It's you, isn't it?

**Can your
network
do this?**

"Connect everything to everything." You probably have one of the simplest job descriptions in your company. And at the same time, you also have one of the most impossible jobs to do.

The fact is, with the complex maze of components and systems you have to deal with, it takes much more than the latest and hottest technology to unify a network. It takes vision. And that's something you're not very likely to get from a narrowly focused manufacturer.

The good news is, IBM has been dealing with the ins and outs of interconnectivity since the first networks were born. So we can help you connect existing platforms and operating systems with just about any kind of hardware and software solution out there. We can also make sure you're ready to exploit new standards like ATM, which represents the high-bandwidth future of networking.

We not only understand the trend to switch-based networks—we're leading the industry by integrating high-speed switching



technology into our full line of network products. This Switched Virtual Networking strategy is part of our Nways™ family of switching products, as well as our workgroup hubs, concentrators and wireless LAN technology. It's also part of our line of adapter cards that can integrate computers of any breed into your network.

No question, the days of single vendor solutions are long gone. But it can certainly be helpful to have one partner who brings a depth of experience and a wide range of product offerings, to make sure

that your diverse network continues to perform at the highest level.

So give us a call today at 1 800 IBM-3333*, ext. DA 108. We'll show you how we've helped companies all over the world gain a true competitive advantage by building a smarter, more efficient network. Or visit our web site at <http://www.raleigh.ibm.com/netad.html> to find out more. After all, you have a world of technology to deal with. And we can help you bring it all together.



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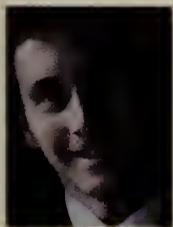
Official Access Provider to The Microsoft Network

Electronic Commerce

Covering: Tools and Techniques for Interenterprise Networking
and Doing Business On-Line

Briefs

■ **VeriSign, Inc.**, the Redwood City, Calif.-based start-up formed earlier this year by RSA Data Security, Inc., Ameritech Corp. and Visa International, Inc. to provide **public-key digital certificates**, has hired attorney and electronic commerce law expert Michael Baum as vice president of practices and external affairs.



Baum

Baum chairs the International Chamber of Commerce's Working Party on Legal Aspects of Electronic Commerce and the American Bar Association's Information Security Committee.

■ **ISED Corp.** has unveiled an encryption device priced under \$100 that merchants can attach to telephones or PCs.

The device creates a **secure point-of-sale terminal** for protection of credit card information over the Internet or standard phone lines.

ISED: (201) 682-5766.

■ **CS First Boston Corp.** will install 1,000 **financial trader phones** made by BT North America, Inc. in its New York operations center.

BT's International Trading Platform intercom system links remote trading floors for investors, and the BT Applications Link software lets a trader who receives a phone call automatically see the investor's portfolio and other relevant information.

■ **New York-based photo agency Index Stock Photography, Inc.** is putting 500,000 images from its photo library on the World-Wide Web at <http://www.indexstock.com>.

The firm said it is developing a proprietary image browser with special features for **downloading images**.

Sony's cybermall will blossom come spring

By Ellen Messmer
New York

Media giant Sony Corp. next spring will transform its World-Wide Web site, now set up as an advertising billboard, into an entertainment cybermall to sell goods and games on-line.

The Sony Station Web site will offer on-line games for children and adults. Developed by Sony Interactive Studios, the games will, for a fee, let Internet users remotely compete against each other.

Because of worries about disrupting longtime relations with Sony distributors, the Web site will not sell Sony audio and video equipment.

Matt Rothman, vice president and general manager of Sony

Online, said Sony initially will only sell apparel and collectibles based on TV, films and music, such as Beatles T-shirts. Sony is entrusting the design of its Web site to Silicon Valley-based consultancy CKS Group.

In addition to offering games on-line, Sony hopes to hook daytime soap opera fans through a service called Soaps Online, orchestrated in collaboration with Columbia/Tri Star Television. Fans will be able to tap into a flood of information about their soaps and purchase merchandise.

Rothman emphasized that Sony Station will be a venue to promote sales of Sony records and equipment. The current Sony Web site, www.sony.com, offers digitally stored album samples and lists stores where Sony products can be purchased.

Rothman said the Web site has surpassed expectations as a promotional tool.

"We've had 100 million downloads to date from the Web site, which has been up for a year



Sony Station is banking on the STT security standard for its on-line purchase orders.

now," he said. "We're clocking in 4.5 million downloaded samplings of music each week."

Rothman said Sony is taking the next step on the Internet, moving from promotion to on-line sales, because of the security afforded through the Secure Transaction Technology (STT) being developed by Visa International, Inc. and Microsoft Corp.

When implemented in Web servers, browsers, Visa credit card processing networks and banks, STT offers end-to-end security for credit card purchases over the Internet.

However, STT can be only used with Visa credit cards.

MasterCard International, Inc. and Netscape Communications Corp., which have claimed that STT is not truly an open industry standard, are working on a separate security protocol.

The battle over standards, if not brought to an end soon, will complicate Internet commerce, forcing merchants, buyers and the credit card processing industry to support dual software standards.

Rothman said the Sony Station deal is exclusively with Visa, but he said he does not want to see the Web site launched without support for STT in the widely used Netscape browser. ■

BUSINESS SPACE

See you see me see filth

Last week, we moved into the home-stretch on the topic of shopping baskets. Well, I'm afraid that for this week, I must digress.

A curious thing happened the other night: I was wrapping up a feature for a forthcoming *Collaboration* supplement in this august journal. One of the products I was writing about was CU-SeeMe, the teleconferencing system from Cornell University.

I decided to check my E-mail at around midnight (rust and Gibbs & Co. never sleep) and found a message from a student at George Washington University.

The thrust of his message to me and admin folks at MCI was obscure. He referred to a couple of CU-SeeMe broadcasts that he noted had occurred at around 1 a.m. on Monday, Nov. 20, and listed the originating IP addresses — one of which looked vaguely

familiar.

Apparently, these two transmissions contained pornographic pictures, and he was kind enough to attach samples of the images. Gee, err, "Thanks, but no thanks."

I, of course, replied with a "huh?" type message and decided to track down the IP addresses. What can I say but "duhhhh..." I did a search at InterNIC and discovered that I am still listed as the domain controller for one of the networks: 204.74.70. It is my network, but I haven't used it for six months.

After some sleuthing, I determined that if the student was right about the IP addresses — a pretty big leap of faith in itself — it would require someone with considerable knowledge about the obscurata of routing to "borrow" an address from my old network.

I E-mailed the student to find out why he was bothering me. He sent back a "Sorry if it



Mark Gibbs

has nothing to do with you" reply, which, considering he sent me pornographic pictures, is hardly an appropriate response. I mean, what if I was a 15-year-old kid running the school network? Well, to be realistic, I guess my youthful libido would survive the ordeal, but that is not the point.

I guess the student must be one of the self-appointed net police who feel motivated to clean up on-line filth.

I tried to call the student, but I have not heard back. On his Web site, the poor dear has put his picture, home address, work number, home number, his sister's number and even some number in Turkey — how misguided can you get?!

As for the use of CU-SeeMe to broadcast porn, are you surprised? I'm not.

I'm very much against any system or law that restricts freedoms. On the 'Net, such restrictions would be the thin end of a wedge into our civil liberties.

Oh, and anyone else who might feel inclined to send me pornography should be aware I have no use for it. I don't even own a pornograph.

Should there be controls on pornography on the 'Net? Drop me the word at mgibbs@gibbs.com or call (800) 622-1108, Ext. 504.



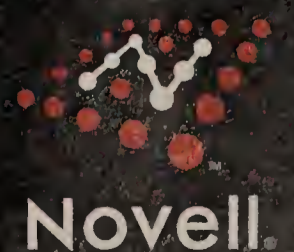
TODAY
TOMORROW

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Network World tracks down answers to your questions. Please submit them to Dana Thorat via phone at (800) 622-1108, via the Internet at djt@world.std.com or via fax at (508) 820-1103.

Warranty woe begone

It took us a few more tries, but we finally got NCE Computer Group to honor the warranty on a failed Mountain Network Solutions tape drive. Chris Dickson, of Elk Grove Village, Ill., had problems getting warranty service from Mountain.

He then discovered the firm sold its tape business to NCE, which promised it would honor warranties on Mountain products (see "Network Help Desk," Oct. 16, page 37).

After the buyout was completed, Dickson still wasn't convinced NCE would honor the warranty. NCE's technical support staff would not commit to repairing or replacing his tape drive because of a question about whether the warranty expired before the buyout was completed, he said.

It took a few nagging phone calls from *Network World* for NCE to see the light, but we got the commitment from the company to repair Dickson's tape drive free of charge.

Do you know of a freeware or shareware utility that will help me log problems and changes made to a LAN?

Bryan Conley via Network World Fusion.

Check out Coast to Coast Telecommunications, Inc.'s World-Wide Web site, which includes an area called SimTel, the Coast to Coast Software Repository.

Point your Web browser at <http://www.coast.net/SimTel/#WIN3> and then go into any of the software collections found there and look for LAN-related utilities.

For \$59.50, you'll find a lot of useful Novell, Inc. NetWare utilities on EMS Professional Shareware's NetWare Utility Library CD-ROMs. The library includes a directory database that enables you to search the utility list or import it into any major database management system, spreadsheet or word processor. For a list of utilities or ordering information, point your Web browser at <http://www.wdn.com/ems/nwutil.htm>.

Packet encryption may bury security concerns

By Patrick Bird

With the growing popularity of Asynchronous Transfer Mode and frame relay services, encrypting data at the packet level is becoming an attractive alternative to the conventional method of securing transactions on a link-by-link basis.

In this increasingly internet-worked world, link-based encryption may no longer be the most effective or efficient approach to network security. Since each site communicates with so many other sites, it is not practical to install a dedicated encryption device at both ends of every circuit.

In addition, as data travels across these WANs, it typically makes several hops from router to router or switch to switch. With link encryption, the data must be decrypted and re-encrypted at each of these points. This exposes the data to security breaches.

With TCP/IP as the protocol of choice for today's WANs, packet-level encryption comes into play. Functioning at the network layer of the Open Systems Interconnection model, the packet-encryption device at the originating site encrypts the entire packet, including the IP header, and provides it with a new header. This new, readable header is simply the IP address of the security device belonging to the destination site.

The entire encrypted payload can traverse a router-based IP network as is. No modification to the WAN's switching or routing fabric is required.

The encrypted packet is decrypted when it reaches the security device at its destination. The temporary header is removed, and the original IP header becomes readable again, allowing the packet to be passed along to its ultimate recipient.

With this type of solution, a single encryption device at each site can support any number of virtual circuits across a WAN. Traffic on each virtual circuit can be encrypted with its own distinct key. This allows Site A to communicate with Sites B and C using a single security device and key management system — but different keys — without making

communications with either party vulnerable to the other.

Encryption flexibility

Another advantage of packet encryption is the flexibility with which keys can be applied to data traffic. Unlike link encryption, where one key is applied to all data traversing a given connection, packet encryption allows keys to be applied selectively to designated packets.

An encryption device could be programmed to only apply a given encryption key to data traveling from one specified IP subnet to another — between two

eavesdroppers to discern any pattern in packet characteristics.

The attachment of an unencrypted header onto the encrypted data and header payload permits more flexibility in the location of the encryption/decryption devices. For example, the device can be placed between the router and the WAN, acting as a secure firewall for all incoming TCP/IP traffic. Or it can be placed on an internal segment, allowing packets to remain encrypted over the campus or building network, as well. This is an important defense against internal security risks.

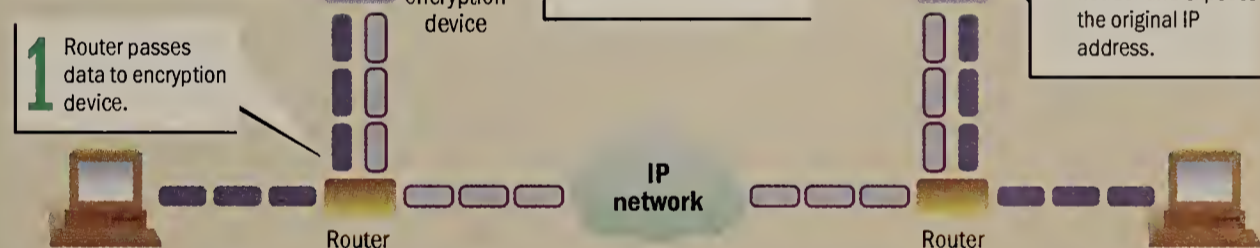
not depend on link synchronization, secure access points can operate at different speeds. A headquarters with T-1 access to a frame relay network can communicate securely with remote offices that use 56K and 64K bit/sec connections.

Freedom from synchronization issues also is important in case of dropped connections. While intermittent network problems can seriously disrupt link encryption, packet-encryption devices can tolerate temporary signal loss.

As corporations depend more on increasingly dynamic

HOW IT WORKS

Secured packet transmission



Encrypting data packet-by-packet ensures a more secure transmission than link-based encryption. Packets remain encrypted until they reach the security device at the

destination site. With link encryption, data is exposed to security breaches as it is decrypted and encrypted by each router or switch along the path.

human resources offices, for example. All other data would be sent in cleartext mode. Thus, instead of having all traffic subject to encryption, only truly sensitive data would be protected.

Since encryption typically makes management tasks — such as protocol analysis — problematic, the ability to selectively secure transmissions is a bonus. By allowing data that does not need to be secured to travel in cleartext mode, management tasks can be performed without complications.

Because each packet is encrypted individually, encryption keys can be changed with virtually unlimited frequency. This enables network managers to avoid the exposure that results when too much traffic is encrypted under any single key. Spoiler bits also can be inserted in the encrypted payload to make it even more difficult for

Packet encryption also allows packets to be time-stamped. This is an effective defense against replay attacks, in which authentic packets are captured and then replayed onto the network at a later time in an attempt to disrupt service. Time-stamping repels replayed packets, preventing them from swamping legitimate data traffic.

Strengthening the net

Because packet encryption devices do not require a one-to-one relationship with the links or circuits they encrypt, network managers can more readily implement redundant devices to avoid a single point of failure. A backup unit can be put on standby, constantly monitoring the main unit. If the main device fails, the backup can take over, duplicating all the encryption parameters that were in force.

Since packet encryption does

networks — and as it becomes more critical to protect the data traversing those networks — packet encryption likely will become an important tool in corporate security strategies. The globalization of business also should boost the popularity of packet encryption because it allows a variety of different algorithms to be used for domestic and offshore links.

Most importantly, the growing use of public-switched networks for critical data communications will be a driving force in the adoption of packet-level encryption solutions that permit virtual private circuits to be secured without depending on the service provider.

Bird is president of Isolation Systems, Ltd., a Toronto-based provider of encryption products and consulting services. He can be reached via the Internet at pbird@isolation.com.

Protect me...from what?

Call it The Information Technology Industry Meets the Internet. Phase II.

In Phase I, entrenched IT companies ignored the Internet. A year and a half ago, the Microsofts, IBMs and Novells of the world seemed oblivious to the developments on-line. Now, as Internet-mania grips Wall Street, Main Street and Hollywood, the big guns have jumped on the bandwagon in a big way. Their message: The Internet is the business opportunity of a lifetime, but you need us to protect you from all the danger that lies ahead.

Case in point: the Comdex celebrity keynotes. The 'Net played a prominent role in, for example, the remarks of IBM's Lou Gerstner and Novell's Bob Frankenberg — and the message was the same: You need us to hold your hand in this scary place.

Don't buy that line. The Internet and providers of Internet-related technologies threaten the established order of business more than anyone could have imagined only a year ago. (Imagine internal Web sites instead of Notes, browsers as universal clients and more.) Internet tools are offering us new ways to build client/server networks and provide collaborative computing capabilities that the big vendors have struggled to deliver for years.

What do you do when threatened? Sow the seeds of fear, uncertainty and doubt. "This is scary stuff," the established players say. "Without an old hand like me, you'll be lost." But embracing these new technologies is no scarier than putting in your first LAN, deploying Windows and I-2-3, or shifting your development to PowerBuilder.

Will the established companies offer interesting Internet tools? Sure. Do you need to wait for them to take advantage of the Internet opportunity? No way.

As you sort through the messages from the IT giants, consider this passage from Gerstner's speech: "We at IBM know all too well that those who dominate one phase of computing are not necessarily the ones to lead the way to the next phase. In fact, they are least likely to accelerate the transition. It's in their best interests to maintain the status quo.... And as we found out, when the industry moves to the next phase, the current leader doesn't always have the right skills to lead the next one."

John Gallant, editor in chief

jgallant@world.std.com

Browsers are coming on strong as the preferred application launching point

The recent release of Windows 95 feels like the end of an era, even though it's being trumpeted as the beginning of a new one.

It's getting harder to care about operating systems. Most have converged on the same quasi-Macintosh design and matured into reasonably reliable, user-friendly computing platforms.

What distinguishes Windows 95 from Windows 3.1 are under-the-hood features such as extended filenames, 16- and 32-bit application support, system self-configuration for plug-and-play compatible devices, native Desktop Management Interface support, and dynamic loading and unloading for docking stations. Most of these bells and whistles seem designed to appeal more to MIS staff than to end users.

From a user interface standpoint, browsers have superseded operating systems as the client design for the new age of distributed, hyperlinked, Internet-ready computing. Browsers provide users with intuitive, seamless and data-rich views of distributed resources and make graphical user interfaces (GUI) such as Windows 95 seem like throwbacks to horse-and-buggy days. Including a World-Wide Web browser and single-button network access in Windows 95 are Microsoft's nods in this direction — a new order in which it will be a major player. But because it is just another licensee of Mosaic browser technology, Microsoft will not be the 800-pound gorilla.

Browsers have changed the rules of client design by placing personalized, document-oriented content right up front. Exemplifying this trend is the Web's home page orientation, which makes application development as simple as composing a document with a word processing style sheet, and network navigation as easy as clicking on salient words, topics, images and embedded links within a document.

Home pages personalize remote sites for the wandering Internaut since each page represents somebody's point-of-view on what information and connections are important. Browsers take personalization further by allowing users to build scrapbooks of favorite sites by placing their Uniform Resource Locators (URL) in personal hotlists — which, in a sense, become users' own home pages.

Browsers are encroaching on the operating system's traditional role as the master launching point for documents and applications. Netscape Communications Corp. and others in the fast-growing Web software market have designed browsers and servers to support a widening spectrum of services, including remote host access, file management, file transfer, E-mail, Gopher, discussion groups, real-time chat, real-time news feeds, cross-platform document publishing, electronic commerce, 3-D visualization, voice telephony and animation.

Over the next few years, Windows and other client operating systems will begin to resemble brows-



James Kobiulus

ers. Operating systems are growing increasingly document-centric, object-oriented and Internet-aware. True document-oriented computing will come to the industry forefront with the next version of Windows — code-named Cairo — which is expected sometime between 1997 and 1999.

By the turn of the millennium, client operating systems

will revolve around hyperlinked network filestores that invoke the appropriate viewers, application tools and communications options when clicked on or otherwise manipulated. Operating systems and even applications themselves will begin to disappear, as the emphasis shifts to hyperlinked documents and applets-on-demand.

No monolithic browser will take the place of the monolithic operating systems and GUIs of yore. Embedded browser functionality and communications protocol stacks will be available as dynamic software libraries to all client applications. Documents generated by any client application will be

able to embed URLs, allowing users to jump to the referenced Web site by clicking on an embedded icon or highlighted text string from within the receiving application.

No one is saying GUI-based operating systems will disappear entirely, any more than the hoary MS-DOS prompt and Unix command-line interfaces have. But they will get pushed to the background as invisible providers of file, communications, print and memory/task management services.

Browsers are fast becoming an important component of enterprise networks, which means you must start to evaluate them as serious candidates for standardization.

If you have been experimenting with multiple browsers, you will find it necessary to narrow the list to a few, especially as you implement Web applications for internal, mission-critical applications.

Browser vendors will have to be evaluated on the strength of their technology, product directions and strategic alliances, just as if they were a supplier of operating systems, database management systems or any other critical piece of infrastructure. Ask the browser vendor how tightly it plans to integrate its products with the various software and networking components of your company's distributed environment.

The days when browsers could be dismissed as throwaway shell programs or glorified shareware are drawing to a close. Browsers are, in fact, windows to a new world of networked libraries, communities and commerce.

Kobiulus, a contributing editor to Network World, is a senior telecommunications analyst with LCC, L.L.C., an Arlington, Va.-based network design and engineering firm. He can be reached at (703) 807-5075 or via the Internet at kobiulus_james@lccinc.com. The opinions expressed are his own.

From a user interface standpoint, browsers have superseded operating systems as the client design for the new age of distributed, hyperlinked, Internet-ready computing.

Teletoons

By Phil Frank and Joe Troise
guru@well.com



Document management fills your information plate

Ernest Eugster

Massive amounts of files, innovative applications and companies seriously wanting to manage information throughout the enterprise have made electronic document management (EDM) a necessity for every network. If you do not have a strategy to manage a flood of information, you face the possibility of "info famine"—a situation that makes getting the right information at the right time difficult.

Last year, E.I. DuPont de Nemours & Co. announced that it would make PC Docs, Inc.'s PC DOCS its corporate standard for EDM.

Bankers Trust Co. earlier this year selected Saros Corp. as its enterprise EDM solution. These large deals confirm what statistics had already begun to suggest: EDM is becoming a major network application.

The U.S. EDM market is up 106% since 1992 and expected to jump another 50% this year to \$269 million, according to Delphi Consulting. EDM's strong growth has not gone unnoticed by Wall Street, either. Shares of PC DOCS, recently priced at \$14, are up more than 1,400% since January. Faced with opportunities resulting from integrated applications, a flood of information and a business climate favorable to process reengineering, leading companies are seeking to turn information into a strategic resource that generates profits.

EDM gives you what you have been seeking for a long time — a simple, enterprisewide library through which all computerized document files can be stored, searched and retrieved.

With EDM, users can access and exchange the most up-to-the-minute versions of important projects, CAD drawings, spreadsheets and customer correspondence. More sophisticated products offer features affecting the entire life cycle of a document, from standardized check-in and check-out to multilevel security, and from document routing to mobile user support. Tool kits are also available for customization.

The necessity of EDM is, in part, a reaction to the massive volume of information flooding corporate networks. According to market researcher International Data Corp., the number of computer documents in the world today is doubling every nine months. In addition, the word processing and spreadsheet traffic on networks is increasingly being supplemented by audio, video and scanned images, creating virtual documents where users can manage different info-objects to meet their needs.

The opportunities presented by new, integrated applications

are also making EDM a necessity. EDM is looking more like a great unifying technology. For the first time, vendors of everything from workflow to imaging to operating systems are talking about using EDM to create a common information management platform.

Novell, Inc.'s Soft-Solutions, PC Docs and Saros have integrated their EDM products with workflow software from Action Technologies, Inc. PC DOCS and Saros software will work in tandem with imaging software from Optika Imaging Systems, Inc., Wang Laboratories, Inc. and Watermark Software, Inc. (recently acquired by FileNet Corp.), allowing access to scanned documents, faxes and optical character recognition text, as well as electronic files. Document management capabilities are also being included in operating systems and word processing programs.



All eyes are on the Document Management Alliance (DMA), which has been working to create standards for consistent access to diverse document repositories. The DMA's work in defining interfaces and data models will result in more commercial off-the-shelf software to reach unstructured data.

The DMA's activities are reinforced by the Open Document Management API, which is recommending desktop interoperability standards for workflow, imaging and office applications to access EDM services. Combined, these activities will fuel market growth and make it easier and cheaper for users to access information. A World-Wide Web site containing draft DMA specifications became operational Nov. 15 (<http://www.aiim.org/dma/index.html>).

A business environment that recognizes the value of process reengineering has further opened the door to EDM. When you reengineer your processes using EDM, you gain the ability to store all structured information in a central location for all to use. Immediate benefits include improved customer service, uniform procedures and shorter time to market.

For firms that are seeing their files and competitors swell to new dimensions, the urge to move to EDM is irresistible. If you want to turn your corporatewide information into a resource that generates profits, the move to EDM is essential.

Eugster is president of DataConsulting International, a Golden, Colo.-based consulting firm that specializes in networking and document imaging technologies and implementations. He can be reached at (303) 279-7587.



IN-BOX

Channel gateways no option

Network World's feature story "Channel gateways threaten FEP future" (Oct. 23, page 45) claims channel gateways will soon become replacements for front-end processor (FEP) function and value. While today's FEPs and gateways are evolving, their roles remain quite different. Gateways primarily provide mainframe access, and FEPs primarily build SNA backbones.

Although channel gateways — from

IBM and others — appear to be cost-effective alternatives to full-function FEPs, they are not yet ready for prime time, especially in multiple mainframe environments.

FEPs operate at the SNA and Advanced Peer-to-Peer Networking session level and provide session routing to multiple VTAMs in one or more data centers while maintaining a single-network image. This single image is essential to enable movement of applications in data centers without impacting the network or users who need to access the applications. FEPs also provide session-level traffic prioritization and pacing, and automatically tune the network based on user application needs.

Today's gateways, on the other hand, do not have SNA or APPN session awareness. Acting on LAN addresses only, gateways push all session-level processing, including routing, onto the mainframe and VTAM. VTAM must perform the routing function, redirecting network traffic to the main-

frame where the requested application resides. This uses mainframe cycles for networking functions. Also, gateways without priority service by session must extend service levels beyond those with priority requirements, thus consuming more network bandwidth.

Gateways without the FEP's session-level functions increase costs by using mainframe cycles to perform networking functions and extra bandwidth to unnecessarily extend priority services. With many SNA networks, these increased costs will exceed the savings realized by purchasing less expensive gateways instead of FEPs.

Several weeks before your story ran, IBM announced a new Enterprise System Connection (ESCON) adapter for the 3172 for \$9,500 — significantly less than the \$15,990 version you listed. This changes the configuration pricing to \$27,272 — 60% less than the Cisco Systems, Inc. or Computer Network Technology Corp. Brixton

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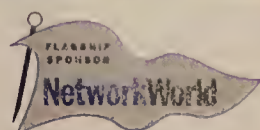
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Feature

Beware the FAX BEAST

Left unchecked, fax costs can be a budget buster. These service and hardware options can help you beat back the beast.

By Tom Brennan

Ask any telecommunications manager how many fax-capable devices are in his enterprise and watch his eyes glaze over. Few know, and most know they don't know.

When it comes to the transmission costs created by fax devices, the knowledge pit grows deeper. According to a Gallup Poll taken last year, 78% of telecommunications managers don't know the cost of sending a fax.

The result: an incredibly large, unchecked and likely growing transmission cost that is hard to put

a finger on. Pitney Bowes, Inc. estimates that about 40% of the total telephone expense on an average large user's telecommunications network is fax-related. To some Asian countries, where 13-hour time zone differences make fax a popular alternative to voice communications, fax traffic can account for 75% to 80% of the total bill.

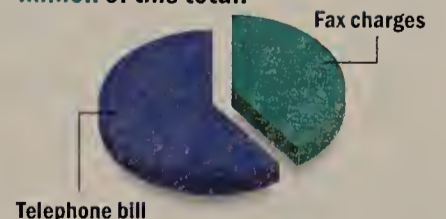
As more devices become fax-capable — most PCs ship with internal data/fax modems as standard equipment — it will be harder to get control over this burgeoning expense. New LAN software options, which make sending a fax as easy as printing a document, are going to make this situation worse.

But there are steps you can take to fend off the fax beast.

Service providers such as Digitran Corp., Fax International, Inc., Graphnet, Inc. and Telstra Network Services, Inc. can help separate fax traffic from voice using higher quality stand-alone transmission networks. The firms generally offer features such as fax status and management reports, and at lower rates than standard voice lines.

If you've got a private network, you could consider using a fax router, which employs spare bandwidth to deliver fax data between Group III fax machines. There are also products that let you cost-effectively ship fax traffic over private nets, frame relay

The average Fortune 500 telephone bill is \$34 million a year, according to a recent Gallup/Pitney Bowes Fax Usage and Application Study. Fax charges account for \$13.6 million of this total.



Continued on page 52



HOWARD FINE

Continued from page 51

links, X.25 services and even the Internet.

Focus on real-time fax

In the past, most carrier fax efforts have dealt with value-added store-and-forward fax services such as broadcast fax, file to fax or delayed send, which lets you take advantage of off-peak calling rates.

But this store-and-forward traffic represents only about 5% of overall fax calling, according to statistics compiled by the "Electronic Mail and Messaging Systems" newsletter. The other 95% is carried in real time—that is, with a connection active between two fax machines simultaneously.

"It's the real-time services that will have the biggest impact on users' phone bills because they are designed around the huge chunk of fax expense that represents day-to-day business transactions," says L. Thomas Walton, president of Walton & Walton Associates, Inc., an industry consulting firm in Richmond, Va. "The best services will not have users change anything about their dialing or transmission habits."

Another problem is that it's tough to predict trends and create strategies because fax costs are intermixed with voice. Roughly 90% of fax devices dial out over stand-alone lines, which don't fall under private branch exchange accounting systems. And increasingly more fax traffic starts out on a LAN and shares wide-area links with E-mail and other applications, Walton says. "The discreteness of the fax

application is lost."

The biggest driver for changing the fax transmission paradigm has been the huge waste that occurs in sending a fax via voice circuits, which use up to 64K bit/sec to carry a voice communication. A standard fax transmission over the same circuit uses 14.4K bit/sec or less; the rest is basically wasted. This has cost implications for the carrier that are passed on to users.

There are also quality problems. With international transmissions, it takes an average of two attempts to complete a transmission.

You can address both those issues by using services based on stand-alone fax networks. "When all your traffic on a given network is fax and only fax, you can offer a broad range of features designed just around that application and be far more efficient at the same time," says Christopher Witt, director of operations at Telstra Network Services.

IXC real-time services

AT&T's International Advanced Fax is a basic fax offering for real-time international transmission. It enhances transmission quality by routing each fax over special preselected digital fiber lines that are continuously checked for fax-grade quality. The service is currently available to six international destinations—Hong Kong, Italy, Japan, Korea, New Zealand and the Philippines. You dial 0 before the

country code in the dialing string to route the calls to this special network.

AT&T has also altered its underlying services tariffs to include rates designed for short-duration international fax transmissions. For instance, with the CustomNet Fax Option, the transmission time is rounded to the nearest second, subject to a 30-second minimum call duration, as opposed to the standard 6-second rounding. With that structure, AT&T claims that a 2-minute call to the U.K. from the U.S. during the standard rate period is priced 11% less than regular rates.

And the option is presubscribed to specific telephone numbers. That ensures all calls are charged the CustomNet Fax rate and helps you get a handle on fax costs.

MCI Communications Corp. and Sprint Corp. do not have specific real-time fax offerings, although both are active in store and forward. Sprint sells its own messaging platform to large end users interested in building private networks tied to Sprint International, which provides messaging/fax systems to post, telegraph and telephone administrations and major corporations in more than 50 countries.

MCI has its OneFax with Global Guarantee offering, which is an 800 number-based store-and-forward service. The OneFax offer is a guaranteed delivery option for international

faxes and covers broadcasts as well as point-to-point fax.

New real-time services arrive

All of the above services focus on circuit-switched links, but some of the biggest fax innovations are in the packet arena.

Telstra—formerly Telstra OTC Australia and Telecom Australia—last month announced a new X.25-based real-time international fax offering dubbed PacketFax. Offered in the U.S. through Telstra Network Services, a newly formed U.S. subsidiary, the service will support links to five countries, with an additional 20 being investigated.

The service will offer management reporting, informational status reports, higher quality transmissions, lower rates and more tailored features—all designed just for fax and carried on a packet-based fax-only network. It will also include the capability to go off-net with indirect access from Australia to all the other countries.

Telstra Network Services won't be selling to customers directly. Rather, it is in discussions with a number of U.S. carriers about distributing the service. One such carrier is expected to be Digitran, a small but fast-growing company that has specialized in real-time and store-and-forward fax applications for some time.

Digitran will use Telstra Network Services to supplement the international termination options offered under its cut-rate FaxSav real-time service family. FaxSav lets you presubscribe lines in certain parts of the country or use a two-stage dialing device that attaches to Group III fax machines. The device automatically routes fax transmissions bound for international locations to the Digitran fax-only network for completion in real-time or store-and-forward mode, based on user-supplied parameters. You can have all calls routed to the Digitran network or just select calls, which can be screened by the device or chosen by individual users.

A key to providing value-added fax options as an offshoot of real-time transmission is delivery notification. Typically, when a user is at the fax machine watching the fax go through, the person can determine problems as they arise, such as an aborted transmission or misfeed. When the network steps in and accepts the fax as an intermediary—as part of a guaranteed send option, for instance—that responsibility falls on the carrier.

"It's got to be simple, similar to what a user normally does, and

FIFTY-FIFTY

MCI estimates that during the business day, about 50% of all calls are fax calls and that, overall, one of every three calls is a fax call.

Tips to help you avoid fax quicksand

To get a handle on fax traffic, those who have beaten the path already suggest you:

■ **Audit and update.** Find out what is already installed, and work with the computer and data sides of the organization to understand which fax-capable devices are being installed on a regular basis.

Consider fax servers, laptops, data/fax modems and personal digital assistants. Also, auditing once is not enough; a process has to be implemented to keep this information current.

■ **Isolate lines dedicated solely to fax and lines shared by fax machines.** This will provide a head start in getting a grip on your actual usage costs.

■ **Understand per-minute vs. per-page costs.** Don't be wooed by pure cost-per-minute calculations. While the average fax transmission takes 2 minutes, a \$.35 per-minute rate does not mean the cost is always \$.70. Retries and errors can

quickly boost the cost of your fax usage.

Some vendors charge per page—emphasizing that you are only charged for successful quality transmissions—but this makes apples-to-apples comparisons tough.

"Marrying fax machine reports with telephone call detail is often a depressing effort," Walton says.

"Marrying fax machine reports with telephone call detail is often a depressing effort," says L. Thomas Walton, president of Walton & Walton Associates, Inc., an industry consulting firm in Richmond, Va. "But it's got to be done."

George Frylinck, vice president at Digitran Corp., notes that the quality of the underlying network will determine how fast the fax machines transmit, so a more expensive, high-quality, fax-only network could give you more savings and better features when it all nets out.

■ **Treat fax as an application in its own right.** Too often people assume that fax is just a voice application. It is not anymore than E-mail is.

By Tom Brennan

Serving up the options for LAN-based faxing

LAN-based fax servers are flooding the market in two main varieties—software- and hardware-based. They differ in terms of initial setup and maintenance cost structures, as well as functionality.

Software-based servers are less expensive but rely on the network to handle multiple simultaneous fax requests and require an additional fax modem for each line.

Further, these packages perform all document translations on the workstation, which means you may have to wait a few minutes after sending a fax to use your PC again.

In contrast, hardware fax servers attach directly to the network and appear as printers. Many accept a print stream from the workstation and translate it into a fax format, freeing up the workstation to the user much faster.

These units typically support multiple lines, and some offer optical character recognition (OCR) and automatic routing of incoming messages.

Key benefits of the server option compared to stand-alone fax machines include increased worker efficiency, better utilization of capacity and improved fax management capabilities, not to mention cost.

Many packages also include a centralized tracking system that helps you accurately assess the costs of fax usage, be it by department or client, and develop cost reports.

If direct-inward dialing is implemented on a fax server, incoming faxes can go directly to each user's mailbox.

Further, some units offer OCR capability, which translates the fax into data format, avoiding the need to rekey some messages.

Perhaps the greatest benefit, although it is mostly overlooked, is that digital faxes will stay in the original condition for as long as the data is kept on an archive. Hard-copy will fade over time.

By Tom Brennan

yet provide the same level of confidence as when the user is standing by the fax machine himself," says George Frylinck, vice president at Digitran. "If you try to appreciably change the way the customer sends faxes, then it won't work."

You can garner significant savings using Digitran because you don't pay for faxes that are not successfully delivered. "On international transmissions, retries due to incomplete transmissions can run 20% to 50% of the overall transmission cost," Frylinck says. Digitran users are also notified of the disposition of their fax within a predetermined time parameter.

Other small carriers are likewise getting into the fax act. Fax International in Burlington, Mass., was launched as a provider of fax service from the U.S. to Japan. Now it uses its 56K bit/sec network to carry traffic from the U.S. to more than 200 countries at discounted rates, according to David Leibowitz, branch sales manager in Boston. The company typically forwards faxes to their destination within 1 to 2 minutes.

Singapore Telecommunications, Ltd. earlier this year bought a 37% stake in Fax International, which is sure to further boost its global presence.

Value-added providers such as GE Information Services and Xpedite Systems, Inc. tend to offer fax as part of a larger package and, generally speaking, concentrate on enhanced store-and-forward fax services.

Value-added providers such as GE Information Services and Xpedite Systems, Inc. tend to offer fax as part of a larger package and, generally speaking, concentrate on enhanced store-and-forward fax services.

New hardware options

In the hardware camp, new options are adding simplicity and value to the traditional fax machine, while network-based fax servers enable users to more easily send faxes. If you aren't careful, however, these devices can magnify the cost problem.

One big issue, particularly with international faxes, occurs when compression is used over voice-band links. To gain economies of scale, most carriers substantially compress international communications, but voice compresses far better than fax. This can lead to fax transmissions being slowed or completely stopped, resulting in excess costs for the sender and undelivered documents.

But there is equipment that will optimize the sending of faxes over the WAN, along with other voice and data traffic.

Long in this market, Micom Communications Corp. has its Sprinter and Marathon data/voice multiplexing products to deal with fax applications over private nets. Micom devices convert the analog signal produced by a fax machine to digital, enabling it to get around compression

problems.

"Essentially, the user can send fax transmissions over any type of network," including private or public frame relay, X.25 or satellite, according to Ken Guy, vice president of marketing and corporate strategy at Micom.

Brooktrout Networks Group, Inc. earlier this year announced the IP/FaxRouter, an addition to its FaxRouter family. IP/FaxRouter lets you ship fax traf-

fic over TCP/IP networks, including the Internet, via a direct IP connection. "This will allow users who can't afford private networks to fax more efficiently," says Michael Malone, Brooktrout vice president of sales.

One manager at a Fortune 500 company who requested anonymity is using the FaxRouter primarily to manage incoming faxes from South America, India, the Pacific Rim and Europe. "In

many cases, the PSTN rates are greater than \$2 per minute or page," he says.

The company is employing its private network to transmit faxes using very little bandwidth — usually 2.4K or 4.8K bit/sec, but sometimes as low as 1200 bit/sec. It has the FaxRouter hanging off fax servers in locations around the world.

"Bombay [India] has been the star performer," the manager says. "The devices

Continued on page 54

FAX MACHINE TALLY

Fortune 500 companies have an average of 374 fax machines company-wide, with an average of 27 per building in 1994, according to a Gallup/Pitney Bowes Fax Usage and Application Study.

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Continued from page 53

cost about \$3,500, but the payback period was only two months because of the high PSTN rates." The company has a FaxRouter in one U.S. location, and the payback period there was six months.

Macy's is another big believer in taking fax off the public-switched net. The company has FaxRouters attached to dedicated lines connecting New York and the Far East. Currently, devices are installed in

New York, Hong Kong and Seoul, South Korea, according to Ben Wong, network administrator in the Macy Product Development Division, a part of Federated Department Stores, Inc.

At first, in New York, the FaxRouter was dedicated solely to the group's fax server. "Then, the realization was made that all of the Group III fax machines could be connected to the device and that other departments could be connected, as

well," he says. "So the FaxRouter helps in two ways: It helps take advantage of capacity available on the private lines, and it lets other groups within the organization get into the act."

Macy's was able to recoup the investment in the FaxRouter devices in less than a year. Savings have come from increased productivity (since users can fax directly from their applications, regardless of the destination) and from reduced interna-

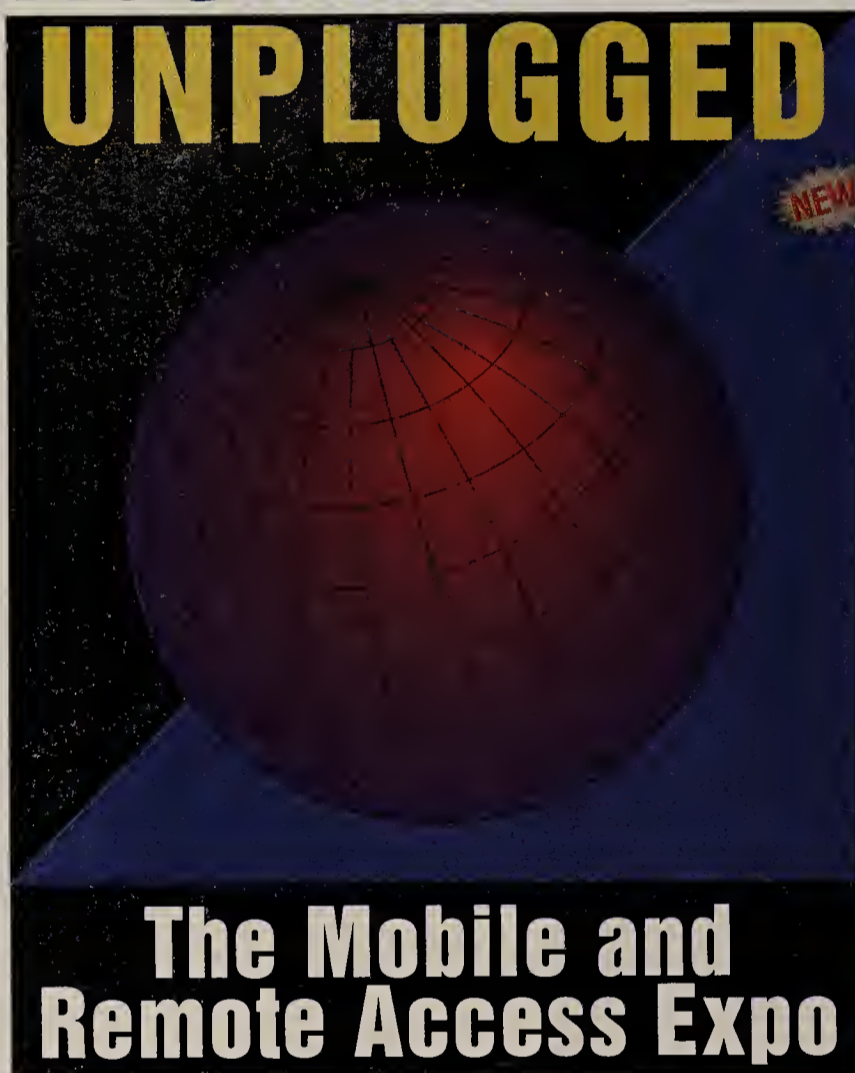
tional direct-dial charges.

Whatever choice you make — service or hardware — the key thing to remember is that fax is not a voice application anymore than E-mail is. Fax deserves special attention unto itself. By planning to look at fax costs just like you look at 800 costs, you can control and understand it. And you'll get a handle on a large portion of your telephone bill in the bargain.

Brennan is a senior consultant at TeleChoice, Inc., a Verona, N.J., consultancy specializing in custom consulting, strategic planning and market research. He can be reached on the Internet at tom_brennan@telechoice.com.

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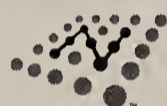
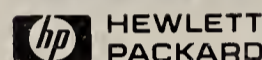
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In-box

Continued from page 47

offerings — making IBM's 3172 the price leader in the ESCON channel gateways market.

Pratt Parrish

Senior programmer, wide-area networking
IBM Networking Systems
Research Triangle Park, N.C.

The authors respond: Our channel gateway cost-of-ownership comparison did indeed look at the economics of channel gateways and drew some comparisons to FEP costs. But it was IBM's own FEP customers who suggested ousting the FEP with a gateway. Dave Nikolejsin at BC Systems, Inc. in Victoria, British Columbia, said it quite succinctly: "The real gain is not having to buy NCP anymore."

Note also that Network World did rework its channel gateway comparison chart to reflect price changes IBM made to its bus-and-tag interface late in the story development process. Had IBM informed us of the ESCON interface changes, we would have done our best to update the charts.

And we respectfully disagree with Parrish's assertion that today's gateways do not have SNA or APPN session awareness. As we reported, at least two vendors — Cisco and Cabletron Systems, Inc. — are shipping APPN support today. And CNT Brixton's Integratea Gateway 6600 provides SNA session awareness, which makes it possible for the gateway to switch SNA sessions between multiple hosts.

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KEAWN08

Views on the Web

By Todd Coopee

Once upon a time, publishing all your vital documents in an internal text database was adequate for most businesses. Today, organizations cannot ignore the Internet as an vehicle for electronic publishing and as a source of information to augment what they generate internally. That means you need tools that help you build World-Wide Web home pages, gather data from the Internet and create documents for internal reference. In something of an electronic publishing triple play, Folio Corp. is addressing all three areas.

Folio's flagship product is the LAN-based Views Infobase Manager 3.1A, a text database system that makes it easy for internal cli-

ents to search and retrieve documents. Recently, Folio introduced Infobase Web Server 1.0, which makes these text databases available to Web users, and Retriever 1.0, a program that can populate Views databases from documents found on the Internet. Working together, those products can enable document-intensive businesses in distributed environments, such as legal firms with multiple offices or service bureaus with on-line clients, to extend text archives across the Internet.

We found all the products did their job well. Although its documentation was a bit sketchy and its tutorial laughably simplistic, Views offers a wealth of features without sacrificing

speed and flexibility. With few exceptions, the initial re-releases of Infobase Web Server and Retriever client were also remarkably robust and left us eager to see what features might be added in future updates.

Inside infobases

At the heart of Folio's information organization is the infobase, which is a single, flat-file database of hypertext links, graphics and multimedia objects. Examples of infobases range from on-line technical manuals to reference and historical volumes to handbooks and sales information.

As a hypertext and hypermedia delivery vehicle, Views sports a host of useful features (see Fig-

FOLIO TAKES ADVANTAGE OF THE INTERNET WITH NEW DOCUMENT PUBLISHING SOFTWARE.

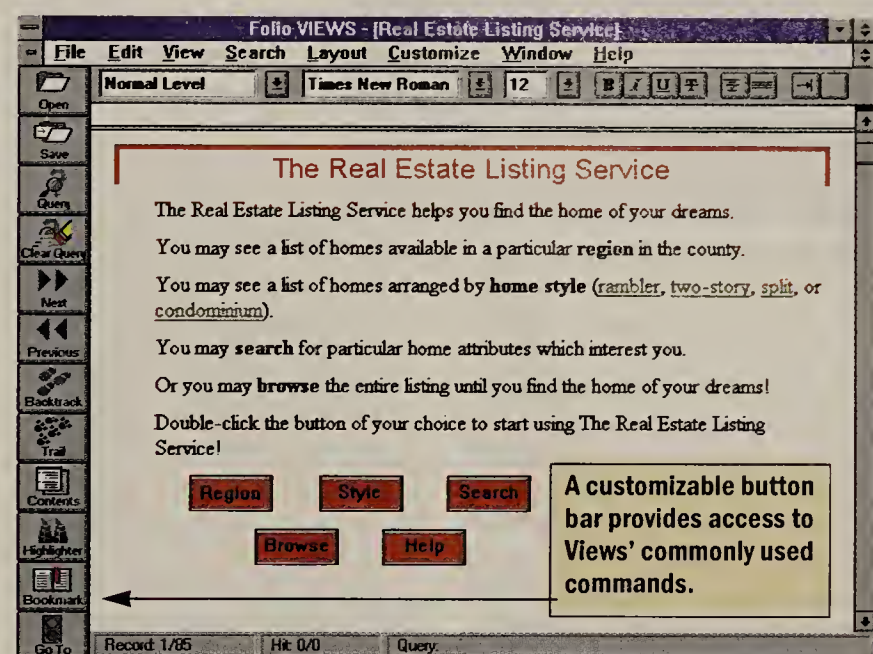


Figure 1: Views Infobase Manager lets you peruse information stored in infobase format.

ure 1). A button bar called Toolbelt provides quick access to most of Views' commonly used commands. If you care to, you may also customize the Toolbelt to include any or all of the features available in the Views menu. Views provides hypertext links to internally stored and external resources, including graphics files and OLE 1.0 objects.

One of the most powerful capabilities in Views is its built-in search and retrieval engine. By default, every word in an infobase is indexed, which we found makes locating specific instances of text strings downright snappy. You can use standard Boolean search operators (and, or, not) and wildcards in your queries. Also, you can employ phrase, word variation and synonym searches. Those features allow you to broaden your searches to include all words that start with a certain pattern of letters or all forms of the word. When a search has been completed, a Results Map window displays the number of hits generated.

The view on Views

We used Views to access and modify a number of existing infobases. In our testing, Views performed solidly. The search

feature was not only intuitive, but also remarkably fast. The Results Map was especially useful when displaying hits from compound searches.

We next created new infobases with two additional packages. The \$895 Infobase Production Kit includes a copy of Views and contains a number of programs required to design and maintain an infobase. At \$3,995, the Professional Infobase Development Kit contains a superset of the utilities provided in its less expensive counterpart. Most of these additional programs are aimed at professional publishing houses that want to produce and distribute infobases on a commercial basis; the less expensive product is probably adequate for most corporate users.

One of the programs available in both kits, the Create utility, allows you to take multiple source files of different formats and combine them to form an infobase. Files listed in a Create Project file are converted into infobase format using any number of import and export filters. Included with the Create utility are filters for WordPerfect and Microsoft Word documents, as well as ASCII text. An additional Filter Add-On Pack, available

Continued on page 56

NetResults

Product	Views Infobase Manager 3.1A	Retriever 1.0	Infobase Web Server 1.0
Vendor	Folio Corp. (800) 228-1132, (801) 229-6700	Same	Same
Price	\$295 for single user	\$95; free to users of Views Infobase Manager	\$6,995
Platform supported	DOS, Windows 3.X, Windows NT, Macintosh	Windows 3.X, Windows NT, Windows 95	Windows NT
Key findings	<ul style="list-style-type: none"> Infobases are fully indexed and searchable. Cross-platform development tools are available. 	<ul style="list-style-type: none"> Can compile information from multiple Web sites into a single infobase. Some problems downloading large images and tables. 	<ul style="list-style-type: none"> Offers multiple security and logging options. Translates infobases into HTML format on the fly.

Continued from page 55

from Folio for \$195, extends Create's filtering abilities into other popular spreadsheet, word processing and database packages.

As Create converts data, it also makes an index of every word it

Extract utility is also available that can export an infobase into another file format.

We used Create to convert a number of files in ASCII and WordPerfect for Windows formats into an infobase. All of the files were imported without a hitch, even large files that contained a mixture of text and graphics. It is worth noting that although we did not run into any major problems, it pays to thoroughly read the utilities manual before attempting a conversion, as the manual contains a number of tips that can greatly reduce the time it takes to convert large files.

Once you've built an infobase, the Validator program is used to verify the links in it. If invalid links are unearthed, they can be removed using the Fixlink utility.

Finally, the production kit includes a complete reference guide to Folio Flat File, an HTML-like language used to add infobase capabilities to text files. This language can be used in conjunction with Folio Search and Replace, a utility that automates the wholesale addition of Folio Flat File codes to large text files.

Retrieving infobases

Besides producing infobases employing in-house materials and a production kit, you can also use Folio's Retriever client to build one from scratch from any site on the Web. The Retriever acts as a Web robot, traversing sites and automatically downloading Web pages and converting them into a Folio flat file. Once in that format, a file can be converted to an infobase easily using Views or the Convert utility.

There are several options for retrieving Web data that can help prevent Retriever from obtaining too much or unwanted information. You can tailor your requests through the Retriever's main dialogue box (see Figure 2), which offers the following choices.

First, you have the option of downloading information from a Web site by keying in a single Uniform Resource Locator (URL) or specifying an external project file containing a list of sites to visit. You can also determine whether inline images, which frequently appear alongside text in an HTML document, are downloaded. If that option is selected, Retriever downloads the image and converts it to a for-

mat that can be seen within Views.

Retriever's Follow and Retrieve Links checkbox allows you to not only receive an HTML page, but also to follow the links that it contains. With that option selected, the Retriever caches links and follows them in the order they were received. To limit how far a particular link is followed, you can specify the number of levels to traverse, the maximum number of documents to retrieve and the maximum output file size to create. By toggling Connect to any Host checkbox, you can also determine whether links to hosts not specified in the initial URL should be followed.

In our testing, Retriever successfully retrieved URLs that used the HyperText Transfer Protocol (HTTP), File Transfer Protocol (FTP), Gopher and Wide Area Information Server protocols. It even logged on correctly to anonymous FTP sites that required a user name and password. Retriever will not traverse URLs containing Mail or News protocols, and it will report as failures documents that require a user name and password.

As an infobase, the newly translated HTML information includes an expandable, hypertext-based table of contents, which makes locating specific information much easier. Our only problems with Retriever were relatively minor. We found it to have problems downloading information from sites containing very large images. It also did not download image maps correctly and performed erratically on pages that contained HTML forms.

Serving up infobases

In addition to allowing infobases to be available to LAN-based clients running the Views software, you can use Folio's Infobase Web Server to offer them up to users on the Internet with Web clients. Simultaneous user access is possible because the Infobase Web Server performs infobase-to-HTML translation on the fly. That makes it possible to update information using Views and have the modifications seen by users accessing the infobase over the Web.

As an HTTP server, Folio's Web offering provides most of the standard features found in other commercial servers. Support for Common Gateway Interface scripts, HTML forms and clickable image maps is included. Infobases may be protected on a user-by-user, group-by-group or domain basis. Server

activity also can be monitored through transaction logging.

Access to an infobase can be secured by using either a global or customized control file.

When viewed using a browser such as Netscape or Mosaic, infobases served up by the Infobase Web Server are presented by employing an interface that is remarkably similar to that of Views. Sometimes, limitations in HTML prevent all the features in Views from being translated properly. For instance, clients using Web browsers won't be able to take advantage of function keys or have justified text.

Selecting the Contents button displays a table of contents window mapping the full information of the infobase. In addition to being available from any document page, the table of contents contains expandable and collapsible branches. Expanding a branch reveals more information and offers more hypertext links into the infobase.

MORE ON-LINE

For a new on-line publication about Folio technology, connect to <http://www.nwfusion.com>. Select NetRef, Reviews then Folio.



To perform a search of an infobase, you click on the Query button. The corresponding page contains a form that allows you to enter a single- or multiple-word query, complete with Boolean values and wildcards. Display option fields allow you to tailor queries. Clicking on the Search button displays all of the records found that correspond to your query in the Results Map. Once a query has been evaluated, you can navigate through the results by clicking on the previous hit and next hit buttons, or selecting the previous hit and next hit hypertext links at the top and bottom of each page.

Infobase Web Server also implements its help system through a series of HTML pages. Different pages are displayed depending on when and where the Help button is clicked. By adding entries to the WWW.SERV.INI file, which controls the infobases served up by the Web server, you can add additional customized help pages.

Using Data Source Manager, we configured our Web server and populated it with infobases created with Views and downloaded using Retriever. Even though using Data Source Manager was easy, we found that edit-

ing the WWW.SERV.INI file by hand was much faster. The sample HTML home page included with the kit made an excellent template for our site-specific version.

Using the Infobase Web Server control panel, we limited access to the server by creating a number of users and groups within Windows NT's System Registry. We also added corresponding entries into an access text file and placed that file in the subdirectory where all of our data was stored.

Once our site was more or less set up, we experienced little difficulty. Infobase Web Server rarely crashed and had suitable error logging to tell us where we were going wrong.

Guides need help

The documentation set that accompanies the products pales in comparison to the included on-line help files in infobase format. But some users, especially those that are new to the infobase environment, may find the unfamiliar format of the help files unapproachable at first. A number of typos and misspellings in the documentation also do not help the cause. Folio might want to consider revamping the printed documentation set, especially the Views *Getting Started* guide, to include a more comprehensive tutorial that really shows off the product's powerful features.

With its suite of products, Folio is a serious contender in the world of on-line publishing. With Infobase Web Server, sites already using Views in-house can provide their information to a much wider audience with minimal start-up costs. Retriever is also an effective tool to augment information and make sense of the morass of data available on the Internet. The cross-platform support with Views is also a nice feature.

If electronic publishing is becoming more important to your site, Folio appears to be a solid choice. ■

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 47.



Coopee is the assistant director of technical services at Trinity College in Hartford, Conn. He can be reached via E-mail at todd.coopee@trin.coll.edu.

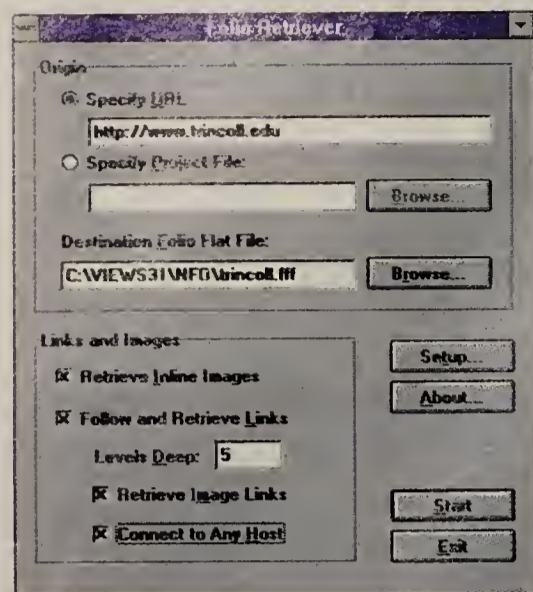


Figure 2: Retriever lets you download data from one or more Web sites into infobase format. You can tailor requests to download image and text.

encounters along the way. At the end of the process, the source data and index are compressed. In our experience, the resulting infobases were usually 40% to 50% smaller than the size of the original text. Create can be used repeatedly to add updated information and recompress the infobase. To complement Create, an

HOW WE DID IT

We installed and tested Folio's suite of Web and publishing products on Intel-based PCs. Version 3.1A of Views Infobase Manager and Version 1.0 of Retriever ran on a 486/66 PC with 16M bytes of memory running Windows for Workgroups 3.11, while the initial release of Infobase Web Server operated on a 486/66 workstation with 32M bytes of memory running Windows NT Workstation 3.51.

We assessed Views by using the Infobase Production Kit to design several infobases from scratch or using existing information in other formats in conjunction with import filters. We made all of the infobases available to Web and Views clients simultaneously via the Infobase Web Server. We tried various security options and logging features. To sweeten the mix of data, we used Retriever to download Web pages from our own local Web site in addition to other remote resources and convert them into infobase format.





Management Strategies

Covering: Career Insights and Innovations
in Managing Staff, Budgets and Technology

Briefs

■ **Three banks recently tapped Olivetti North America** to head up various network projects. Here's a feel for the project scope at each bank:

Commercial Credit in Baltimore turned over to Olivetti remote network monitoring and management chores for its dealer service centers, which process retail consumer loans.

Magnolia Federal Bank for Savings in Hattiesburg, Miss., hired Olivetti to design and implement a routed WAN and an enterprise electronic mail system that supports retail services across 65 branch offices. The bank has also outsourced server staging, installation and project management to Olivetti.

Middlesex Savings Bank in Natick, Mass., had Olivetti install LANs in 20 sites as well as design and implement an enterprise E-mail system. The bank also had Olivetti stage the network servers, set up IP addresses and install Microsoft Corp.'s Office suite.

Olivetti: (509) 927-2070.

■ **Telework Analytics International, Inc.** this month released **TeleworkAudits**, a Windows-based program that can help managers determine the costs and benefits of allowing employees to telecommute.

TeleworkAudits enables managers to answer a series of on-screen questions that provide the pertinent data needed to conduct a cost/benefit analysis of allowing employees to telecommute.

The data that suggests whether it is cost-effective to allow an employee or group of employees to telecommute can be exported to a Microsoft Corp. Excel spreadsheet for further analysis.

Priced at \$49.95, **TeleworkAudits** is currently available for Windows 3.1 or Windows 95. A Macintosh version will be released early next year.

Telework Analytics: (301) 417-1444.

Web holds promise as corporate training tool

College's experience proves the Web could be a schoolhouse.

By Jim Brown

When the University of Alabama decided in 1992 to offer an on-line workshop on how to best use the Internet, it expected no more than 40 people to participate. But when notice of the course went out over the Internet, registration applications started pouring in — 864 of them from 20 countries.

A second workshop drew 15,000 participants from more than 50 countries. Earlier this year, the school used the World-Wide Web to distribute self-paced Internet training materials to 17,000 subscribers, and it will continue using the Web to send educational materials to even more users.

The University of Alabama's wild success proves the Web holds tremendous value as a corporate training tool, says a report

on the subject from International Data Corp. (IDC), a Framingham, Mass.-based research firm.

However, you've got to be willing to lay out the developmental dollars to come up with your own course-authoring software today or wait at least nine to 12 months for vendors to supply it for you, the report concludes.

The report, written by Ellen Julian, an IDC senior analyst in IT training and educational services, points out the pros and cons of using the Web as a training tool (see story, this page) and provides evidence that a number of vendors will soon be producing Web-based versions of existing CD-ROM interactive educational programs.

Indeed, vendors such as Web Educational Support Tools, Ltd. (WEST) of Dublin, Ireland, and

AimTech Corp. of Nashua, N.H., have already released software for authoring interactive courses for the Web.

WEST's tool, also called WEST, was developed at University College Dublin and can be used to write client/server-based multimedia applications that enable students to browse

were used to write computer-based training programs.

IDC's report also suggests that Sun Microsystems, Inc.'s Java, an object-oriented Web development technology, can also be used to develop training applications.

Java can be used to build Web-based applications that can download small pieces of code called applets to local workstations. Those applets can run on the workstation and interact with Web resources.

Another technology that will give a push to Web-based training is Cornell University's CU-SeeMe, free software that allows users to establish black and white videoconferences over the Internet.

CU-SeeMe enables you to use low-cost desktop video cameras to capture your image and existing workstation monitors to display the images of others in the conference.

With these tools and more coming on the market, the report recommends that companies at least investigate using the Web for corporate training but warns you to invest cautiously.

In the same time it takes you to develop internal applications, there will be more and more powerful shrink-wrapped packages hitting the market. ■

MORE ON-LINE



Get more information about the Web authoring tools and the CU-SeeMe software mentioned in this article on Network World Fusion. Visit <http://www.nwfusion.com>. While you're there, you can also request more information on this IDC report, "Using the Web to deliver IT training and education: A current assessment of the competitive environment, Report No. 10646."

course material on the Web or even on a LAN server.

AimTech released in October Version 7.0 of its IconAuthor tool, which adds a number of features needed to develop Web-based interactive learning applications to earlier versions that

Web training pros and cons

Here are some factors to weigh before turning thumbs-up or -down on using on-line classrooms.

PROS

■ You can keep materials fresh and up-to-date thanks to the nature of HTML, which makes it quick and easy to change pages.

■ The World-Wide Web can be less expensive than using computer-based training (CBT) on CD-ROM because material is stored centrally or at mirror sites instead of being duplicated and distributed. Furthermore, HTML and emerging course authoring tools will make it somewhat easy to convert CBT programs on CD-ROM to the Web.

■ Training staff can reach more people with less strain because the need to travel is reduced. On the flip side, remote classroom costs are lessened because students can be taught while in their own offices.

■ The Web can be used for nearly any type of training, everything from helping users understand how to operate PCs to learning business processes.

CONS

■ The Web makes it too easy for students to stray from the course structure by following hotlinks in random order instead of in linear fashion.

■ Likewise, overuse of hotlinks or forcing students to explore needlessly for material can make them feel lost, which can disorient them and ruin the training environment.

■ Students may dislike not having a teacher in the classroom that can provide immediate reassurance or answer questions. Even though students will be able to send electronic mail to the teacher, it will take time for them to get a response.

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North Central:
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Pacific:
\$26,196

Southeast:
\$22,732

South Central:
\$22,786

Note: All figures represent the mean average based on responses from 938 companies.

GRAPHIC BY SUSAN PULASKI

SOURCE: HELP DESK INSTITUTE, COLORADO SPRINGS

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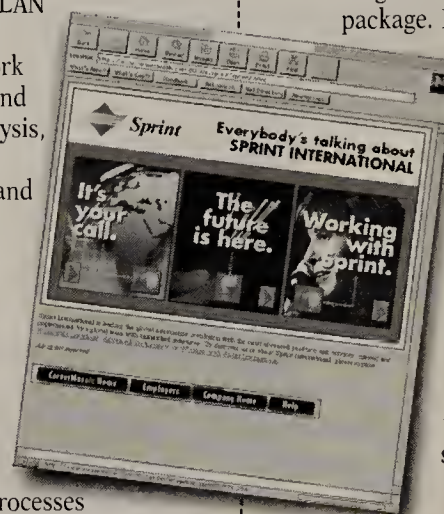
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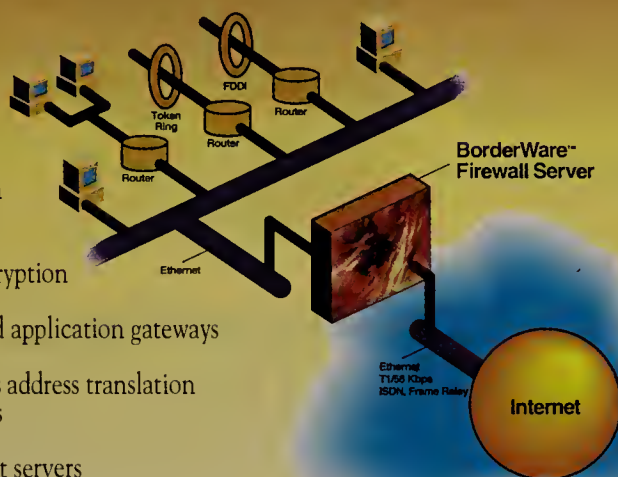
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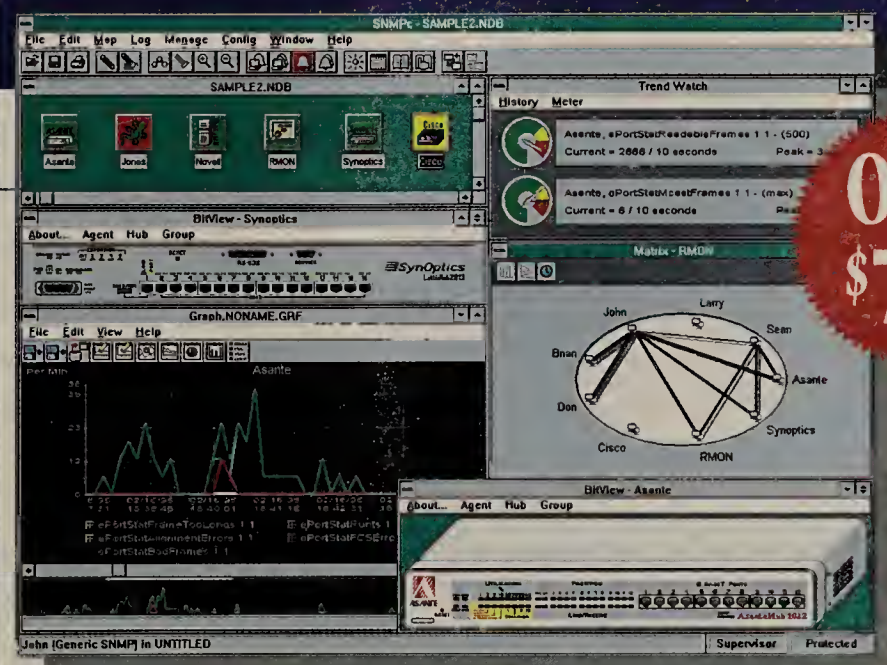
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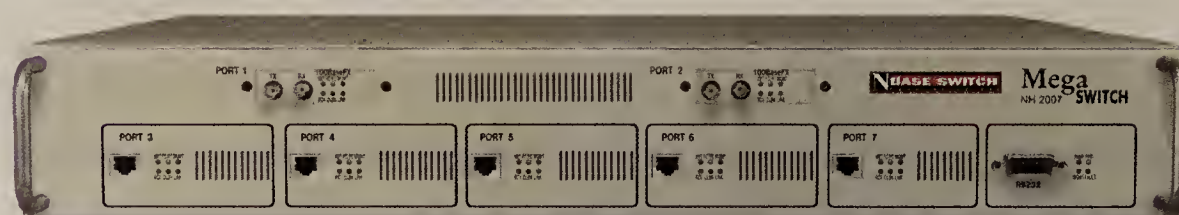
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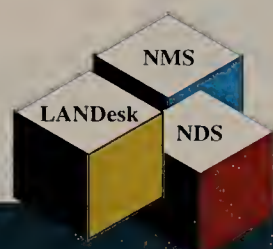
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Ether Express 10/100 PCI (PILA8465B)	
Single/5PK/20PK	\$148/695/2,603
Ether Express PRO/100 32-bit EISA (EILA8265)	\$235



New Intel Smart 100 Nitro High Performance Server Adapter (PILA8485) \$745

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10/100 Mbps EISA (UTP100E)	\$370
10/100 PCI (UTP100P)	\$235

3COM

10/100 PCI (3C595TX) Single/5PK/20PK	\$169/754/2,740
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PCI Quartel, Full Duplex, 4RJ45 Ports (EM400)	\$1,137
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Thomas Conrad

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Katron

100VG ISA Adapter (OP-161)	\$149
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100VG 32-bit PCI (J2585A HP)	
Single/6PK/24PK	\$216/1,268/4,094

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Fast Ether TX-10/100 NuBus (PN990)	\$328
Fast Ether TX-10/100 PCI (PN994)	\$240

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Cogent

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PCI-ST Connector (EM100FX)	\$499

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EISA (SAS) FDDI Adapter (NP-EIS-D50)	\$1,510
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155.52Mbps PCI ATM Adapter with 512K Memory (ENI-155P-MF-C)	\$1,200
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Networth

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Dual Speed Fast Ethernet Hub 24-Port (MICRO10/100)	\$3,565

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Tiger Hub 100 16-Port 100Base-TX Hub (SMC5116TX)	\$2,398
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100 Base-TX 12-Port Hub (DFE-812TX)	\$1,475
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Asante

100 Base-TX 12-Port Stackable Hub	\$1,675
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12-Port 100Mbps Hub (AT2202-001)	\$1,740
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3Com

100 Base-TX 12-Port Stackable Hub (3C250-TX/1)	\$2,028
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100VG-AnyLAN Hub, 6-Port/12 Port (DP1006/DP1012)	\$840/1,330
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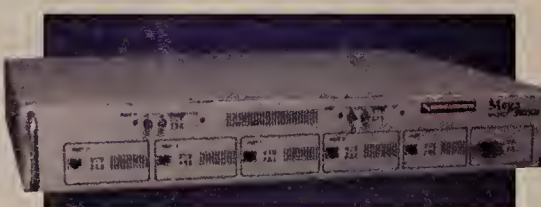
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Advanced Stack 100VG 15-Port Hub, Stackable up to 16 Hubs (J2410A)	\$2,262
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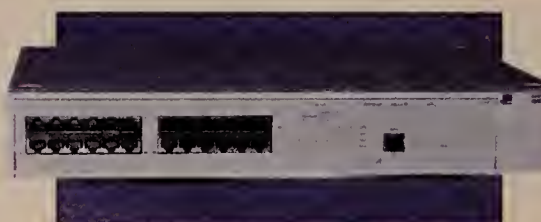
Stackable Ethernet Switch, Six 10Mbit Ports Plus Slot for 100Mbit Fat Pipe (XE-XM-2410)	\$2,495
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PRDStack EtherSwitch Stackable Ethernet Switch, 16 RJ45, 2 expansion slots for high-speed modules, 10Base-TX/ATM (PSP16-M001)	\$6,370
(PSP16-M041)	\$7,095
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ISA RJ45/BNC (LANET16C) Single/6PK/24PK	\$137/795/2,902
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ISA PRO/10 RJ45 (PCLA8225A) Single/5PK/20PK	\$106/450/1,655
EISA RJ45/BNC/AUI (EILA8225) Single/5PK	\$217/954
PCI RJ45/BNC (PCLA82) Single/5PK/20PK	\$162/767/2,807

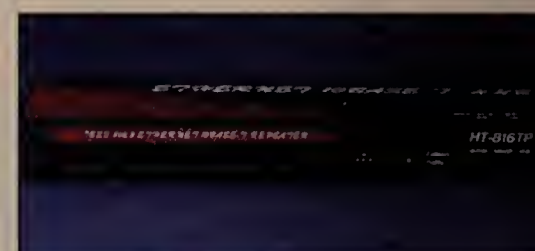
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ISA RJ45 (3C509B-TPD) Single/5PK/20PK	\$99/445/1,630
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EISA RJ45 (3C579TP) Single/5PK	\$239/1,019
EISA BNC (3C579TP) Single/5PK	\$239/1,019
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Advanced Stack 24-Port Hub (J2601A)	\$972
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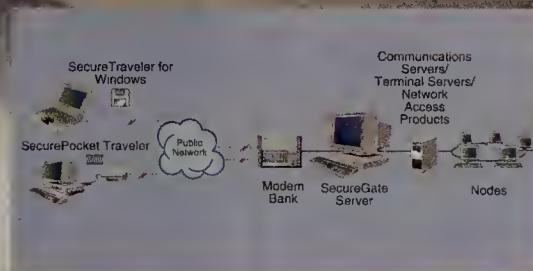
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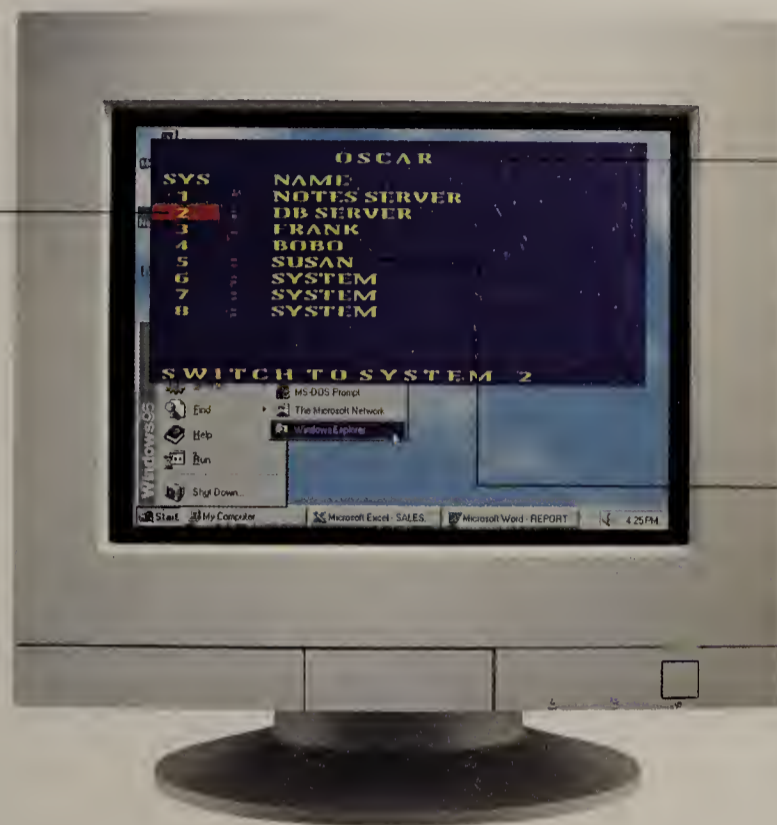
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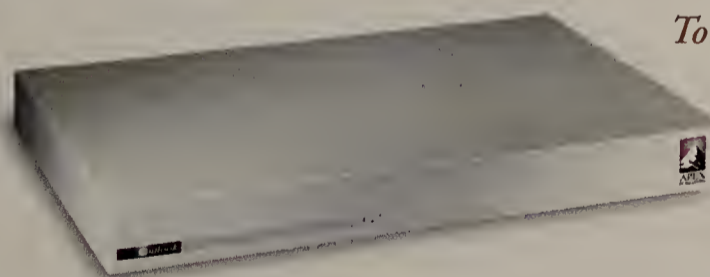
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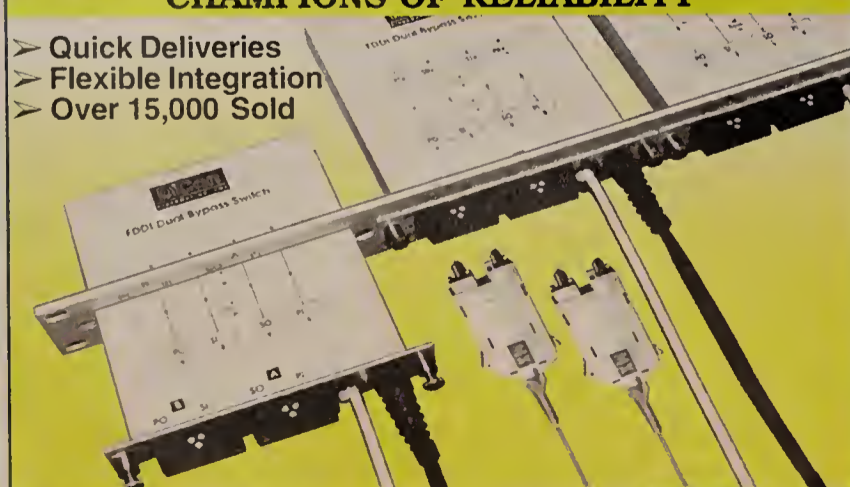
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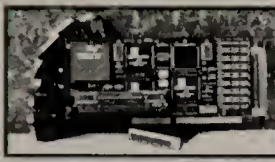
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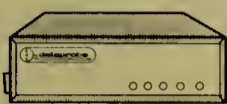
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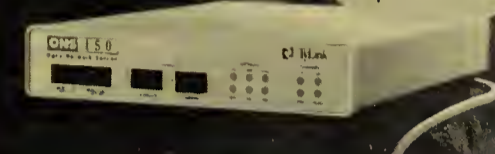
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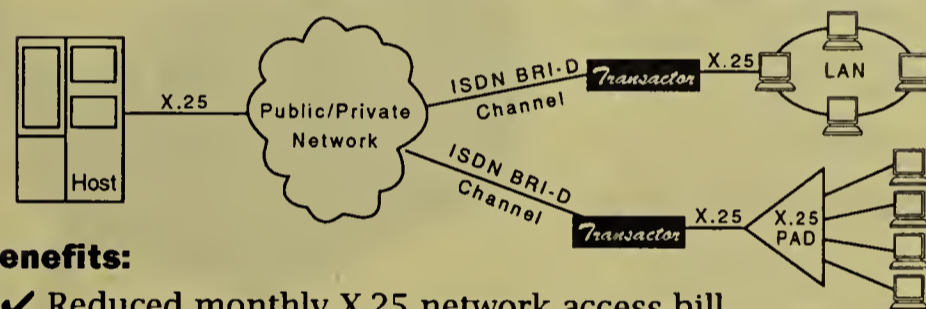


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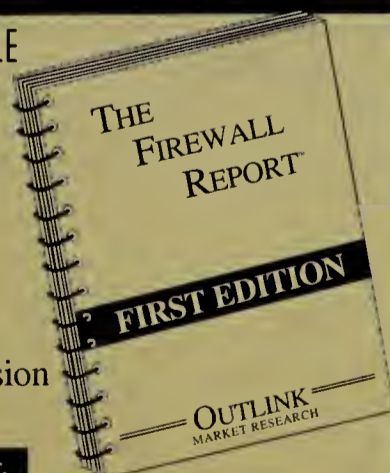
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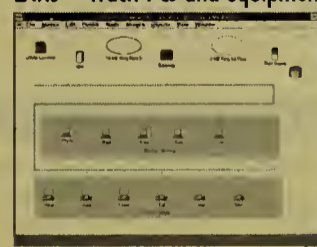
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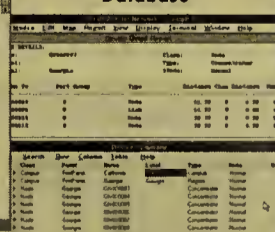
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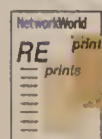
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Net mgmt.

Continued from page 1

ing it by the functionality of SNMP."

Hamilton objects to an IBM plan to use Simple Network Management Protocol to carry DMI data, thereby preserving customer investments in SNMP management consoles.

Microsoft, on the other hand, stands accused by IBM and others of not fully endorsing DMI, opting instead to embrace its Plug and Play and OLE technologies, and use only some portions of the DMI standard.

But the Microsoft-IBM scraps were merely sideshows to frank talk on the anemic state of systems and net management.

The roundtable discussion, anchored by executives from IBM, Microsoft, Intel Corp., Tivoli Systems, Inc., Bull HN Information Systems, Inc. and the Desktop Management Task Force (DMTF), brought to light a number of issues that indicate cross-platform, enterprise-level systems management is taking a backseat to vendor-specific solutions—and will for some time.

Superficial integration

Earlier this year, 200 *Network World* readers rated available management tools as "only adequate." Buyer discontent is largely due to the lack of integration among products, says Terry Dickson, marketing manager of Intel's Management Product Operation.

"There have been strides to bring products together, but a lot of enterprise management products still [are not integrated]," Dickson says. "No one vendor can do it all. We have to work together, and the products need to work together, and it hasn't happened fast enough."

Adds Martin Neath, vice president and general manager of Tivoli Management Environment core products at the company: "I think part of the dissatisfaction is that for most customers, integration has been at a very superficial level; it's mostly through an iconic launch from the desktop."

The DMI vendor-driven effort is supposed to provide a common integration point for management data across disparate platforms. However, DMI is evolving slowly, and while vendors are beginning to spin out DMI-enabled products, there is controversy about the need to fully support DMI.

In fact, the DMTF—which steers DMI development—has made concessions that let operating system vendors optionally

support the DMI's component interface, a move that seems to largely benefit Microsoft.

"Our role needs to be in not so much expecting operating system vendors to conform their drivers to what we say they ought to be, but rather taking the information they have and making it available in a standard way to management applications," says Ed Arrington, DMTF chairman.

Adequate support?

Conceptually, the DMI architecture maps out a service layer that is supposed to hide operating system dependencies so developers don't have to worry about them. And the DMI component interface lets hardware and software systems components be managed by applications that issue calls to the DMI.

Eliminating the component interface for operating system vendors seems like a step in the

The DMTF's Arrington disagrees. Customers want high-quality management data from a range of platforms. "We're just giving operating system vendors the flexibility to use the component interface or their own system capabilities to provide that information," Arrington says.

But if operating system vendors don't support the component interface, will third-party vendors still be able to develop network and systems management applications to one interface, or will they have to develop for operating-specific environments? McConnell wonders. That was the reason the component interface was developed in the first place.

"I think that's the key point," says Leo Cole, manager of strategy and global design for IBM's System Management offerings. "The [component interface] is absolutely a critical part of the DMI architecture. The component vendors are not in the business of management; they are in the business of writing applications or LAN adapters. They don't want to figure out how to do management on every platform in a different way and how to instrument it to support Plug and Play on one system and something else on another system."

But Intel's Dickson says the component interface is largely irrelevant to third parties. "We talked to the component vendors," Dickson says. "They said if they decide to move a product from Windows to OS/2, it's going to take a lot of work and the benefit they get from a common [component interface] is close to zero."

Adds Microsoft's Hamilton: "The other thing we are saying is that for people who are going to be delivering Windows applications, they are going to have to

write to the operating system anyway. We're just going to take advantage of that and expose that information to the [management interface] for them."

That compares to developers writing to the operating system as well as to the component interface. "So we're actually reducing the amount of effort that the vendors will have to do," he adds.

Open debate

One issue vendors seem to agree on is that the open management frameworks and common database schemata championed not too long ago appear to be dead ends.

"Customers have been very frustrated with the 'open' issue," says Bill Wood, vice president and general manager of Bull's Integrated Systems Management operations. "They've heard different stories from different vendors about what openness really means. They still have the fundamental issue of how they manage their enterprise in an integrated fashion, and I think they've lost patience with the 'open' argument; they just want a solution, they don't care how it's done."

In lieu of open frameworks into which you could plug best-of-breed products, vendors are now swinging toward the integrated management suite, where they work with several vendors to integrate management applications and provide a system that blankets your management needs.

A prime example is a deal Bull struck to integrate Microsoft's Systems Management Server (SMS) into Bull's Integrated Systems Management offering. Rather than tightly embedding SMS in Bull's database structure, the companies share common objects, so Bull can use predefined objects, rather than reinvent them.

"The objective is to provide an integrated application as rapidly as we can and provide those layers of integration that are appropriate for the time," Wood says.

Microsoft, however, takes a

"Integration today has been in only a few specific areas. It hasn't covered the complete suite of systems management operations and tasks that users want to do on a day-to-day basis."

Martin Neath

Vice president and general manager of Tivoli's TME core products

"We need to be providing full DMI [and] development tool kits so vendors can instrument products easily and have the management consistent across the operating systems."

Leo Cole

Manager of strategy and global design for IBM's System Management products

"Our goal is to expose [management data] through OLE, and we would like other vendors to expose data through OLE because then integrating it is trivial."

Keith Hamilton

Program manager for Microsoft's Business Systems Division

"Our role needs to be in not so much expecting operating system vendors to conform their drivers to what we say they ought to be, but rather taking the information they have and making it available in a standard way to management applications."

Ed Arrington

Chairman of the Desktop Management Task Force

"[Users] still have the fundamental issue of how they manage their enterprise in an integrated fashion, and I think they've lost patience with the 'open' argument. They just want a solution; they don't care how it's done."

Bill Wood

Vice president and general manager of Bull's Integrated Systems Management division

"Customers don't expect stand-alone tools; they expect tools to work together as a suite in the same way they do with word processor and graphing packages."

Terry Dickson

Marketing manager for Intel's Management Product Operation

wrong direction to some because it was designed to support a broad spectrum of workstation components. Microsoft's Plug and Play, on the other hand, works predominately with network interface cards.

The component interface accounts for "a lot of other things besides adapter cards on a desktop system," says John McConnell, president of McConnell Consulting, Inc., who steered the roundtable.

and that's what customers want."

The issues, says Bull's Wood, are that customers are impatient for products, and vendors feel the pressure to get products out. "We have to continue to provide solutions while we're waiting for the standards."

What really needs to happen, says the DMTF's Arrington, is for vendors to make management information widely available.

"We need the operating systems instrumented, we need the applications instrumented, we need the components instrumented, we need management applications taking advantage of the information that's available," he says. "DMI's the perfect framework for doing all of this; we just need more of it done." ■

➔ Read a complete transcript of the roundtable discussion on-line.
➔ Link to <http://www.nwfusion.com>: Select NetRef, Technology Resources then Management.

BeyondMail

Continued from page 8

based workflow processes with the Web. The links, however, are not a direct gateway for converting BeyondMail forms to HTML, confirmed Eugene Lee, vice president of marketing for BeyondMail.

The links will let users write scripts that can either take input from a Web site or query a Web site and return the response to a user by E-mail, Lee said.

With the hooks, Webmasters could add a "Learn More" button to a Web site that, when clicked, launches a BeyondMail

process to gather information and mail it to a customer over the Internet, said one source.

The BeyondMail client also will support the Web with a feature that can automatically launch the Netscape browser, Lee said. Users can double-click on a Web address in a piece of E-mail and BeyondMail will launch Netscape to take them there.

In addition, BeyondMail will add support for Simple Mail Transport Protocol, Post Office Protocol 3 and Multi-purpose Internet Mail Extensions, Lee said. That will let BeyondMail clients act as full-function Internet mail clients. ■

Middleware

Continued from page 6

EDA/SQL's current proprietary database connections and a standard ODBC interface. That move would open up EDA/SQL to any ODBC-compliant front-end application.

On the management side, IBI is reportedly forging deals that will ease the administration of its middleware.

Specifically, the company is building an interface to link EDA/SQL to Tivoli Systems, Inc. object-oriented management environments. That interface is expected in the second quarter

of next year, sources said.

Another technology agreement — with U.K.-based Software One, Ltd. — will yield an IBI product, dubbed EDA Exchange, for modeling data and moving those models between repositories.

Analysts applauded the initiatives and said they will help expand the reach of EDA/SQL through the enterprise.

"These moves will make EDA/SQL much more flexible," said Wayne Eckerson, an analyst at Patricia Seybold Group, Inc., a market research firm in Boston. "They will move it out of the straight SQL query market and

into the client/server application integration space." Taken together, the initiatives "should help make EDA/SQL more than an SQL gateway," Eckerson said.

One EDA/SQL user was particularly intrigued by the addition of messaging capabilities.

"I think messaging would relieve some of the load on the network because, right now, you have to be connected all the time [in order to do queries]," said Ricardo Bartra, end-user computing manager at Alamo Community College in San Antonio, Texas, which uses EDA/SQL as part of a student information application. ■

ITT

Continued from page 1

Mafale, who oversees the net for ITT's investment division, upgraded to Version 4.1 only because he had to put 318 users on a single NetWare server running cc:Mail and the largest NetWare 3.X license only supports 250 users.

ITT's corporate decision makers initially had no interest in following Mafale's lead. In fact, they had issued a moratorium on upgrading operating systems before being won over by the radical administration cost cuts and security improvements experienced by Mafale's group, thanks to NDS.

Once Mafale bought into NetWare 4.1 and NDS, he went about convincing his divisional bosses and the corporate Information Management (IM) group.

Mafale showed IM that once administrators mastered the intricacies of building and maintaining the directory, NDS made security more consistent across servers and let LAN administrators audit files to see who made changes and when.

KEYS TO THE MOVE

- Standardize naming conventions among organizations.
- Plan server migrations conservatively, one or two at a time.
- Use third-party migration tools to ease bindery/NDS conversions.
- Be flexible to views of other divisions and cooperate on internal standards to make corporate buy-in easier.

The ability to audit files is a huge advantage to Mafale's group, which is made up of traders and brokers dealing with sensitive information.

NDS made LAN management so much easier, Mafale decided not to fill three administrator slots that were open.

The task force

IM was enthusiastic enough about the plan to create a task force whose mission was to build a model for a corporate directory that would let divisions upgrade at their own pace and plug their directories together easily into a companywide system.

Over months of meetings, the group hammered out standard naming conventions and guidelines about administrative privileges that could be applied across the company.

Division marches to NDS order

While the standards effort was moving along at the corporate level, Art Mafale, network architect for ITT-Hartford's investment division, worked to consolidate his own net.

Mafale's LAN was a conglomeration of five independent LANs thrown together into one group due to a reorganization. The net supported a high-volume, high-pressure trading environment that included specialized applications with a high uptime requirement.

"By the time I got here, there were two administrators keeping seven servers together with Band-Aids and duct tape," Mafale said.

Despite the need for change, Mafale swapped out the NetWare 3.X servers slowly.

The most daunting part of the migration — building the NetWare Directory Services (NDS) tree and bringing up the first NetWare 4.X server — actually turned out to be fairly easy.

Using the DS Standard utility from Preferred Systems, Inc. in West Haven, Conn., Mafale pulled all the bindery information into an off-line NDS database. He manipulated that information

into the tree structure he wanted, then pushed it back onto his first NetWare 4.1 server once it was up and running.

"I thought it was going to take me Saturday and Sunday," Mafale said. "I was done in four hours on Saturday morning."

Then he used the same tool to pull information from other 3.X servers into NDS and employed the NetSynch utility in NetWare 4.X to synchronize changes made in NDS to the binderies.

The migration has saved "wear and tear on the LAN administrator's shoes" by giving them a single interface to make changes, he said. It also made it easier for users to access applications on more than one server by eliminating the need to hard-code drive mapping into workstation boot files, Mafale said. Users can also log on and work from any workstation.

"We've brought about a level of consistency [among workstations], so there's no more customization," Mafale said. "We're set. The administrative work has been a piece of cake."

By Kevin Fogarty

The idea was to create a top-level tree that would act as the hub for independent directories in each division.

LAN administrators would maintain local control of their divisional nets, but the corporation would have a single view of the WAN and have access throughout the enterprise.

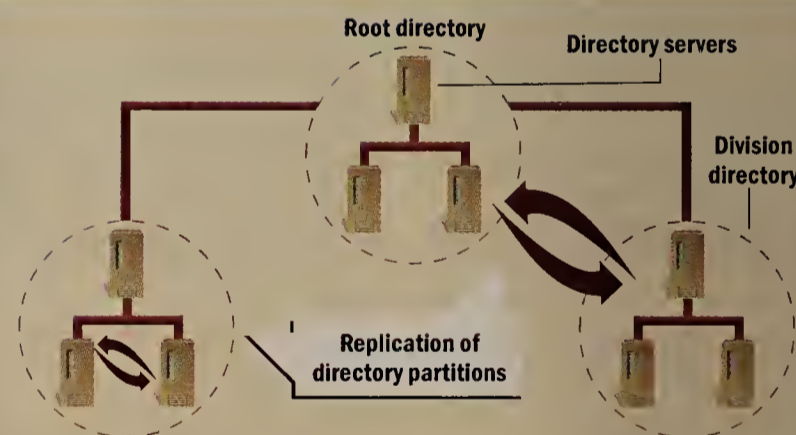
That model keeps the divisions as autonomous as possible while still allowing users in different divisions to share files or migrate from one division to

A replication model defines how many replicas exist, where they are stored and how often they are updated.

ITT decided that each division would store the master version of its tree on its own server and maintain local copies of all its own partitions.

However, a read/write copy of each partition would be stored on a server maintained by IM at the corporate offices in the event that a partition got corrupted across all of a division's servers.

ITT-Hartford's net directory scheme



ITT is letting individual divisions oversee their own NetWare Directory Services directories, but corporate IS keeps a master directory to support cross-company communications. Directory partitions are replicated within divisions as well as between divisions and corporate IS for redundancy.

another without recreating network identifications.

"First, we're trying to standardize the naming convention for the servers," Mafale said. "People have gone hog-wild on the WAN, naming servers everything from 'Tom's Server' to something that should mean something to your division."

The second priority was to come up with a model for how NDS segments would replicate across the net. Replication is the process of breaking a large directory structure into partitions and copying them to servers across the network.

To make the process of copying and storing partitions as bulletproof as possible, IM also maintains a set of servers whose only job is to replicate from the division to the corporate network.

"We saw that as the point of least failure," Mafale said. "At least I know that there's a server dedicated strictly to replicating partitions, so I don't have to worry about it crashing because an app takes it down or something else abends it."

IM currently has only a couple of test servers running which help maintain Mafale's net. ■

OLE

Continued from page 1

Developers now have a clearer idea of how to activate objects and secure calls between them, according to Jeff Tancill, a senior consultant for The Cushing Group, Inc., a Nashua, N.H., training and consulting company.

For example, the document defines a standard COM interface, called IActivationS, that allows programmers to obtain a security descriptor for a COM object. The descriptor is used to control access to the object by employing configuration information found in the Windows Registry and managed by the Service Control Manager.

Microsoft also defined the characteristics and behavior of the low-level network protocol, sometimes called the wire protocol. It is based on Microsoft's implementation of the Open Software Foundation, Inc.'s Distributed Computing Environment remote procedure call.

The protocol specifies which data formats are sent between COM objects. For example, Microsoft now has described standards for what are called marshalled data packets, stipulating details of the message formats to be used by OLE objects on the network.

"This protocol is the linchpin for moving forward on interoperability with other platforms," Tancill said.

Missing in action

But other essential elements of Network OLE are still sketchy or missing entirely, and Microsoft officials could not be reached for comment before presstime.

They include a distributed naming service, object-level security and a centralized security administration model.

Microsoft also skips over how the COM Library, the base object technology, is to be implemented on non-Microsoft operating systems, said the Cushing analysts.

Security administration will become more urgent as Network OLE edges toward reality. "We've found that as you go to large-scale deployment of distributed computing, the administrative model for security becomes very important," said Erik Townsend, president of Cushing. ■

COMMENTS?

See "How to reach us" on page 5.

Cisco

Continued from page 1

The 1010 will replace Cisco's LightStream 100 as a high-powered workgroup ATM switch. The 16-port, 2.5G bit/sec LightStream 100 is manufactured by NEC Corp. and resold by Cisco under an OEM arrangement. Sources said Cisco is offering LightStream 100 customers a 50% rebate on their switches as an inducement to upgrade to the 1010.

"You can trade that in and get half credit on the old switch," said Jerry Hedstrom, president of systems integrator Gig Harbor Networks, Inc. in Seattle and project manager for the King County, Wash., ATM WAN.

Cisco's high-end LightStream 2020, meanwhile, will be positioned squarely as a network edge switch for customer premises and as an access and backbone switch for carriers, analysts

said. Some users deployed the 2020 as a campus/building backbone ATM switch, an application for which it is "overkill," they said.

Cisco would neither confirm nor deny that the 1010 will be announced this week.

LightStream 1010 will feature a class-of-service module, which

sources referred to as a "feature card." The feature card will allow users to add ATM Forum-compliant services as they are defined, as well as other Cisco-developed ATM services.

For instance, the feature card will incorporate silicon and processing engines for ATM traffic management, including flow control, priority queuing and buffering schemes, in its first release, sources said.

The feature card also is expected to support:

- Policies for ATM quality-of-service.
- Intelligent packet discard and

"They've really thought a lot about what needs to be in it and how these things need to work. They've done an excellent job."

AT&T

Continued from page 10

is providing a secure, useful economic underpinning so that people can transfer value, certify transactions, authenticate who is on the other end of the line.

Companies like AT&T are trusted and can be counted on to be there for a few years, and to invest in R&D to keep ahead of the nasty elements who like to defraud our networks. [We're] going to have a chance to get a lot of good business.

Network Notes and NetWare Connect Services are fascinating because they embody this idea of the public network becoming an application platform. What will make customers, who are accustomed to private networks, comfortable with those services?

Let's take an insurance company as an example. An insurance company can use Lotus Notes to put all of its processes on a broad nationwide network so its agents and/or its customers can access the people and the information they need.

They can buy a policy, trade in their policy, handle their transactions from anywhere in the country. That is very powerful. It allows you to cut out middlemen, to be more responsive.

We're in the business of helping our large customers make more money and have better relationships with their custom-

ers. You're letting the insurance company contact either its customers or its agents anytime, anywhere and deliver to them all the information they need.

What do you do to expand this notion in the marketplace?

You get it up and make it work. Lotus Notes and NetWare Connect were difficult to get up and make work on a large scale. They are now in general release. You have Version 1.1 out there.

We're going to have to keep improving that until we get up to Version 3-something, and then we really have mass utility.

Step 2 is for us to be out there with people who are developing tools, who are working with applications developers — both customers and independent developers — so they can easily develop apps for that network.

Step 3 [involves] developing a strong consulting capability that speaks the languages of [vertical] industries.

Let's talk about multimedia. You have a lot of different initiatives. Do you think customers are confused about your strategy?

You bet. And we are in no way the only people adding to their confusion. It is confusing because technology enables things before customers can put them into the context of a problem they want to solve. We're only getting to the stage where the

traffic policing for congestion management.

■ Multicast replication for efficient cell distribution to a subset of nodes.

■ Statistics gathering.

■ Available bit rate service allows traffic to use available network capacity, rather than requiring users to dedicate capacity to specific applications.

LightStream 1010 also is expected to support the ATM Forum's Private Network-to-Network Interface (P-NNI) specification. P-NNI allows users to interconnect ATM switches from different vendors.

In its first release, LightStream 1010 will support P-NNI peer groups of 200 switches, sources said. Over time, LightStream 1010 will support hierarchical peer groups.

"It looks like a very nice switch," said David Meyer, senior network engineer at the University of Oregon in Eugene. "They've really thought a lot about what needs to be in it and how these things need to work. They've done an excellent job."

LightStream 1010 will be posi-

tioned against Fore Systems, Inc.'s ASX-200BX and 200BXE, analysts said. The 2.5G bit/sec 200BX costs \$21,950, and the 2.5G to 10G bit/sec 200BXE starts at \$42,500. Both switches are currently shipping.

Prices for LightStream 1010 start at \$19,000, sources said. It will ship next spring.

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Back to Reality

The feel-good IETF process is due for a change

Rudeness among recalcitrant politicians has risen to a new intensity, all in the name of passing a budget and improving our quality of life. The players' real motives are getting reelected and boosting political power.

Such antics are not limited to Washington. They also (less visibly) affect the world of networking. Unfortunately, some technology debates are becoming rude, even as childish as current jousting on Capitol Hill.

One squabble concerns revising the popular Simple Network Management Protocol. Last summer's revision effort by the protocol's "Gang of Four" hit a snag. Two of the SNMP authors — Marshall Rose and Keith McCloghrie — wanted to drop Version 2's remote security configuration and public-key encryption components. They said the omission would make it less costly to implement. The other two — Jeff Case and Steve Waldbusser — opposed that idea.

Discussions became so rancorous that the Internet Engineering Task Force's (IETF) Network Management area manager declared a two-month cooling-off period.

The hiatus is over, but SNMP's authors are hotter than ever. Squabbling extended to the IETF's mailing list early this month.

Case said the SNMP working group was "victimized" by various factions who "hijacked" the open process. Case is organizing an unsanctioned SNMPv2 review meeting during the IETF's conference in Dallas early next month.

Case calls himself Dr. SNMP. He was a computer science professor at the University of Tennessee and now devotes himself full-time to running his company, SNMP Research, Inc.

McCloghrie and Rose shortly followed with messages disputing Case's claims. In a lengthy discourse titled "What About Jeff?," Rose admitted that "the V.2 situation is a mess" and said he and Case each deserve half the blame. Rose accused Case of privately manipulating the development process to his company's advantage. (Case denied this.) He also said Case is miffed that the revision's title page will list only the editor's name. Case's and other authors' names will move to an acknowledgment section.

(The last slight sounds as serious as President Clinton making Newt Gingrich exit Air Force One through the rear door.)

To help restore credibility to the working group, Rose proposed that the Gang of Four voluntarily expel themselves from the IETF for one year. Each could still write code but not directly participate in or directly influence the IETF process.

A slew of IETFers were unhappy with the idea. They did not want to lose anyone's expertise. Their counter-

proposal: partial participation.

This Solomonic path, however, would be too complex. Rose quipped that Case could participate on even-number days, while he would pitch in on odd-number days, "but only if there are no more than two vowels in the acronym of the working group."

Whatever they work out, the stakes remain high. Just

as the budget controls government power, protocols control computer networking. And controlling protocol development guides the product agenda.

It's not hard to comprehend why Case objects to being delisted from SNMPv2's title page. Recognition for authorship is part of the aura of power in technical circles.

On the other hand, it's hard to say who should get credit for group-oriented development

projects. Like most standards, SNMP was not created ex nihilo. Its roots were the Simple Gateway Management Protocol (SGMP) used to build the NSFNet's regional networks. SGMP's authors were Chuck Davin, Marty Schoffstall, Mark Fedor and Case. The remaining Gang of Four joined the SNMPv1 party at various stages of its development.

This latest rift should be a warning sign for the IETF about changing assumptions, how it works and what kind of organization it should be.

Some IETF members still see the organization as an

altruistic club. Last week, one member proposed "thoughts on the importance of modesty and decorum, and the need for an IETF code of conduct." (Everything is "proposed" until members sanction it by committee vote.)

The code lacked any disciplinary measures, aside from requiring incorrigibles to apologize in public.

Give me a break. This ain't the Boy Scouts, guys.

Like it or not, the days of engineering altruism and mushy concern for "the community" are gone. Case may be guilty of private lobbying to benefit his company and customers. But what businessperson wouldn't do likewise? IETF work is a mental game for some, but its results are no longer academic. Business decisions, products and livelihoods now depend on its results.

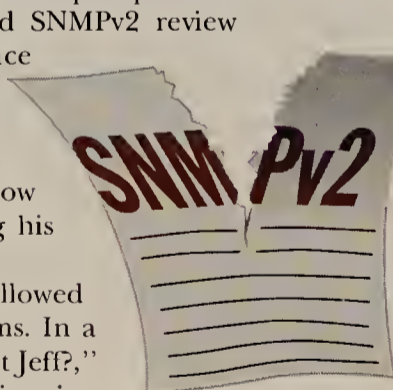
IETF movers and shakers must decide how to adapt the organization to today's reality. Until they do, expect more bruising and rude exchanges to ruffle naive feathers.

Maybe it's time the IETF wrote its own Contract With America. Its feel-good modus operandi for public and private behavior needs change.

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David J. Buerger



A B E N D

abend (n) 1: abnormal end to a computer process 2: the column that spares no expense to bring you the insights of Internet users and other high-tech wits

Ah, users (Part 98)

(Arthur Provost)

I was doing systems administration for the "Air Farce" a few years ago and got a (L)user story that tops 'em all. The help desk gave me a call from Major So-and-so who was having a problem with his workstation. I spoke with him and he told me, "Every time I switch it over to 'Official,' the damn screen goes blank." I went down to see what this "Official" switch was. After nearly getting court-martialed for laughing so hard, I spent about 20 minutes explaining to this ex-pilot that "Off" was not an abbreviation for "Official."

And a cartridge in a pear tree...

(Jeff Mason)

On the 12th day of Christmas,
my true love gave to me
Twelve modems calling
Eleven screens a-saving
Ten keyboards clicking
Nine mice a-pointing
Eight meg of RAM
Seven desktop cases
Six sound cards playing...
Five...Pentium chips
Four floppy disks
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Two CD-ROMs
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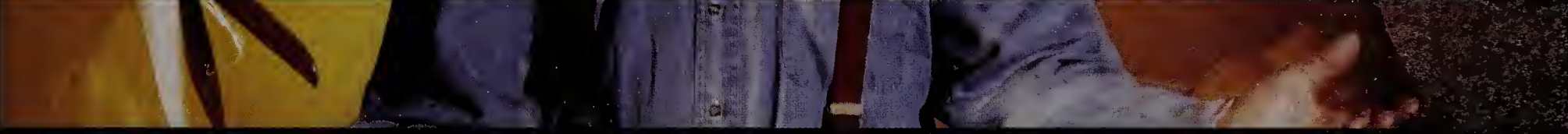
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